# IMPLEMENTATION OF INCLUSION IN NEW BRUNSWICK

# SECONDARY SCIENCE COURSES

by

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A Thesis Submitted in Partial Fulfillment
of the Requirements for the Degree of

**Master of Education**

in the Graduate Academic Unit of Education (Curriculum Studies)


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This thesis is accepted by the
Dean of Graduate Studies


THE UNIVERSITY OF NEW BRUNSWICK

November, 2020

# ABSTRACT

This research explorers the operationalization of inclusion in New Brunswick secondary science courses. Ten teachers from seven schools in both rural and urban sectors of an Anglophone School District agreed to participate. Data were analyzed through a constant comparative model and three major themes emerged. The first, classroom composition, indicated that the presence or absence of specific learners guides how science teachers present concepts and the depths to which they can be covered. The second, planning time, illustrated the importance of collaboration between professionals within a school for inclusion to be carried out successfully. The third, execution of daily lessons, explored the day-to-day changes that influence teaching despite long-term planning. Teacher stress level is perceived to be on the rise, but many teachers were hopeful for meaningful educational reform.

# DEDICATION

I dedicate this to my family, whose support and love guided me through this journey.  My

children, Ben and Kate, were particularly important in this process – it is your school

experience I hope to change for the better!

# ACKNOWLEDGEMENTS

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# List of Symbols, Nomenclature or Abbreviations

AP – Advanced Placement

EA – Educational Assistant

DEECD – Department of Education and Early Child Development

PL – Professional Learning

PLP – Personal Learning Plan

M&R – Methods and Resource

# Chapter 1: Introduction

As a teacher about to enter my sixteenth year of practice, I have had a variety of experiences regarding the implementation of inclusion in New Brunswick schools. Ranging from a small rural school in Stanley, to the second largest school in the province, I have witnessed the purposeful (and accidental, in the case of Stanley) attempt at inclusion. In certain cases, inclusion was the only option when class sizes were too small to warrant separate courses. In my time in Stanley, I taught a combination Biology 112/113 and a makeshift Biology 120. Neither of these courses have direct curriculum prescribed by the Department of Education and Early Childhood Development (DEECD). This past year, I had the opportunity to teach Human Physiology 110 with a colleague for the first time. It is a new course in New Brunswick, taking the space left vacant by the Biology 113 just removed. Being a "Level 0" course, it was meant to be accessible to all students. This was made clear to me through multiple conversations with the administration team in our school. Consistently, I was reminded by them to ensure that the course was to be presented in such a way that we "wouldn't lose the lower half". This struck me in that either a) my administrators did not have the confidence that my colleague and I could pull off such a feat, or, b) the administrators themselves were not entirely sure how this would work, but felt the need to remind us of its importance. I would like to believe that it was the latter as this may have happened in the past. However, this brings me to the point of my research: teachers and administrators are aware that New Brunswick is to have a fully inclusive education system. How that will be operationalized in a secondary science course is not entirely clear.

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With the passing of Bill 85 in 1986 (MacKay, 2007), New Brunswick began the decades-long process of enhancing inclusion in the province's classrooms. The dissemination of the Porter and AuCoin report, "Strengthening Inclusion, Strengthening Schools" made public the pathway forward of implementing inclusion (Porter & Aucoin, 2012). Noteworthy was Section 10 of Chapter IV, which made seven specific recommendations for high schools. These recommendations referenced students, teachers, administrators, and the schools themselves. Ultimately, this led to the DEECD's development of Policy 322, Inclusive Education (Department of Education and Early Childhood Development, 2013) which was meant to serve as a set of guidelines for Superintendents, administrators, teachers, support staff, and parents. As a science teacher in this province, I have become increasingly interested in the practical implementation of these guidelines. Having two young children who will soon enter this system has only increased my motivation to know more about this enactment of inclusion. Although I have had experience in four different schools in our province, those experiences are uniquely my own and I would like to explore how inclusion is implemented in other science classrooms. Thus, my research question is:

**How do New Brunswick high school teachers implement inclusion in their secondary science courses?**

Through my research, I gathered data from a diverse sample of participants that represent the variety of science classrooms in New Brunswick public high schools. As with all Canadian provinces, New Brunswick has a mixture of rural and urban schools. To reflect this, I wanted to gather participants from schools in both large urban centres and small rural communities.

**Significance of the Study**

In 2013 the DEECD in New Brunswick released Policy 322 which details a set of guidelines for employing inclusion in this province, but this is not a guarantee of implementation. It is important for all stakeholders in education, such as parents as well as those in the education system, to be aware of the steps that are being taken to implement Policy 322. Being in a public school daily exposes me to a myriad of anecdotal comments that teachers have regarding inclusion at our school. These comments have left me with the informal impression that many believe the policy is a means of saving money; which of course are not the documented explanations for Policy 322. In this study I will refer to the "evidence-based practices" that are recommended in the Policy 322 document (EECD, 2013, p. 5, 9, 13) to examine how inclusion is being operationalized by ten different teachers in their science courses in New Brunswick high schools. This enabled me to offer evidence-based insights that do not blindly criticize the government's practices (anecdotally, as is often the case), but rather provide a critical lens through which both the public and the teaching staff involved can engage and understand inclusion in action better. Inclusion will impact all learners in the classroom; therefore, what inclusion encompasses is comprehensively important.

When one considers the recent immigration of refugees into Canada, I believe it opens a window for some useful research to guide teachers moving forward. Although immigration is nothing new (especially when you consider diverse cities like Toronto or Vancouver), both the cultural background and life experiences that immigrants bring with them, are quite foreign to most Canadians. This is particularly true in smaller cities or

towns that may not boast ethnoculturally, racially, and religiously diverse populace (Hamm, Maston, McLoughlin & Smith, in press).

Inclusion in New Brunswick falls into the same classification I have been finding in most research – students from all walks of life, intellectual abilities, ethnocultural backgrounds, are thrown into the same room. As will be addressed in the Literature Review, inclusion often surrounds the notion of removing specialized schools or courses for students with academic difficulties in favour of incorporating said students in typical classrooms. The reality is that this narrow view of inclusion is going to have to expand if a fully inclusive model is to be successful and sustainable in New Brunswick. Recognizing that international students are part of the inclusion framework and require consideration will be important for their success. Distressingly, the approach I have observed so far has been to place these students into level 3 classes because they struggle with English. Many teacher colleagues of mine have expressed discomfort in having international students in their classes as they simply do not know how to effectively address their learning needs and incorporate them into their courses. This comes back to the ideas of best practice where the desire for enhanced professional learning is universal. Objective 1 of the *10-Year Education Plan* (2016) does state that we should "strive to increase awareness and appreciation for individuals and cultures" (p. 8). When you review the research to this point, the recommendations for *inclusive* classrooms and *diverse* classrooms are most often the same. Ethnographic research would be invaluable here as it would provide some context for teachers (and the public as a whole) to begin with. Therefore, this will be the subject of a more in depth literature review I will

conduct after collecting my initial data. This is in keeping with my decision to use grounded theory as my methodology.

There is also a lack of discussion with regards to exceptional students with intellectual gifts. The argument could be made that these students are afforded opportunities through Advanced Placement (AP) courses in large secondary schools, but no such option exists in small rural schools or the middle school and elementary years. It would be beneficial to see some research with regards to best practices for these students. In this thesis I will outline existing literature that has examined the very nature of inclusion and its implementation, including a cursory glance at secondary courses. My focus is on the views of inclusion both domestically and internationally, with specific insights into New Brunswick's particular approach. I will also outline a method by which I answered my research question; that is, I will examine how New Brunswick teachers implement inclusion in their science courses.

# Chapter 2: Literature Review

As will be explained later, my choice of methodology for my research is grounded theory. Although it was initially introduced by Glaser and Strauss (1967) as a formal methodology, there have been many interpretations of its use in the intervening years (Corbin and Strauss, 1998; Glaser, 1998; Charmaz, 2017). However, consistently within this grounded theory literature is a caution regarding literature reviews. As Glaser (1998) made abundantly clear, "do not do a literature review in the substantive area and related areas where the research is to be done" (p. 67). Because of the inductive nature of grounded theory, Glaser contends that excessive review could inadvertently influence the researcher to develop a theory that reflects the literature and is not truly inductively drawn from the data. Thus, although I did conduct a literature review, it is meant to be an overview of how inclusion has been defined and studied in prior research. I have purposely omitted research that was specifically focused on secondary science classrooms. This literature will be used to situate the findings from this research in the latter chapters of the thesis.

## Key Scholars in Inclusion

Over the past two decades, three individuals have played prominent roles in the implementation of inclusion in New Brunswick. Wayne MacKay was commissioned in 2004 to develop a report on the current status of inclusion and to make recommendations moving forward "designed to take inclusion to a new level of applied reality" (McKay, 2004, p. 4).

Dr. MacKay is a law professor at Dalhousie University. Many of his published works focus on the legal aspects of education including teacher and student rights. His findings for New Brunswick were summarized in *Connecting Care and Challenge: Tapping Our Human Potential* in 2006 (often referred to as the *MacKay Report on Inclusion*). MacKay's findings served as a springboard for Dr. Gordon Porter and Dr. Angela AuCoin whose work was commissioned by a different provincial government under a different party banner for an audit on inclusion in 2010.

New Brunswick employed Dr. Porter and Dr. AuCoin to provide a framework that could be used to develop a new inclusion policy. This was provided in a summative work titled, *Strengthening Inclusion, Strengthening Schools* in 2012. Although considered an authority, Porter has not produced any peer-reviewed research, and his doctorate title was given to him as an honorary degree from Peru's National University of Education in 2009. As such, he is often presented as a long-time advocate and expert of inclusionary practices. AuCoin did earn a PhD from Western University in 2009 and has published research articles since AuCoin (2013), AuCoin and Vienneau (2015).

The general view that Porter and AuCoin held regarding inclusive classrooms can be summarized by their statement, "Teachers who embrace inclusive practices should be able to support students to learn in their common learning environment with age-appropriate peers and assure that personalized learning needs are met" (2013, p. 149). A two-page subsection of Porter and AuCoin's work was dedicated specifically to recommendations for secondary schools. Though the focus of my research is centred on science courses, no core or extra-curricular subjects were referenced specifically in the report. Actionable items were outlined with some directly connected to the core of this

research project.  In section 10.1.4 Porter and AuCoin recommended: 1) the creation of a tool for identifying teacher leaders capable of facilitating professional learning with colleagues, specifically one that could identify the "skill of high school teachers to meet diverse student needs" (2012, p. 164).  Arguing for the importance of the transition to secondary school from middle school, they recommended 2), "The structure for Grade 9 education should be examined with an emphasis on smaller classes and nurturing stronger relationships between teachers and students that can result in higher levels of student engagement and student learning" (p. 164).  Referencing the role of Methods and Resource teachers, they suggested 3), "Districts must mandate and make clear that the role of the education support teacher – resource, must be supporting classroom teachers through mentoring, coaching and co-teaching" (p. 164).   All three recommendations outlined above have the potential to directly impact how science teachers implement inclusion.  Other educational scholars were referenced to support their recommendations regarding the importance of personalized support for learners (Janney and Snell, 2006; Villa *et al*, 2005).

In the United States, Dr. Dorothy Lipsky and Dr. Alan Gartner published *Beyond Special Education: Toward a Quality System for All Students in 1987, which according to National Professional Resources, is* considered a seminal work on the topic of inclusion. Reviewing the existence of a dual education system of regular education and special education, they were early and strong proponents of common schooling for all students. Since that time, the two have published in multiple formats including professional educational journals, books, and peer-reviewed academic journals.

Dr. David Rose and Dr. Anne Meyer proposed a universal design for learning. Rose (2001) succinctly described it as, "injecting flexibility into the materials and methods used in the classroom". This has laid out the founding principles both have advocated for in every classroom, all based on diverse networks that students engage, learn, and express themselves through. Both researchers have dedicated their academic careers to the advancement of this concept through the Center for Applied Special Technology (CAST). Their work was closely aligned with the theory of multiple intelligences proposed by Dr. Howard Gardner in 1983.

**Inclusion in its Many Forms**

What is inclusion and is it fundamentally different than diversity? Inclusion conjures up images of students of varying academic abilities all learning in the same classroom. It is described as "meaningful and effective instruction not only for students perceived as disabled, at risk, or gifted, but also 'allegedly average' students" (Villa, 2005, p. 34). However, in a broader context of the word, inclusion incorporates other facets of learners. Curran (2003) expressed concerns regarding teacher training to deal with the "growing linguistic diversity" (p. 334). In other words, there needs to be a focus on international students who present unique challenges not because of intellectual difficulties, but rather linguistic and cultural differences that depart from the dominant language and culture traditionally found in the classroom and learning community. Ironically these facets are often treated as mutually exclusive, as opposed to fitting under the umbrella of inclusion. The majority of research is directed at one particular type of education, and how that group of leaners fits in with the norm. For example, the report

produced by Porter and AuCoin (2012) mentioned the expression *international student* only once in the entire 243-page document, and even then it is only referenced as someone's title as an *international student learning specialist*. Additionally, there has been found to be a lack of resources to support New Brunswick teachers in addressing the needs of new Canadians (Arnett, 2014). The lack of resources stands out that as although attention has been given to increasing number of international students, such as refugees arriving from Syria, it is not a guarantee that support will increase.

There are several stakeholders involved in New Brunswick education. Principally these are the students in the classroom, both those who are classified as *regular*, and those who are deemed *exceptional*. Exceptional in most New Brunswick scenarios means a student with intellectual exceptionalities as outlined in Porter and AuCoin's work as evidenced by its connection to personal learning plans in section 10.5.2. Similarly, Policy 322 states, "a learning environment based on one or more specific diagnoses/labels of disability or exceptionality" (p. 3) when addressing segregated classes. What stands out here is that the literature used to provide the framework for inclusion in New Brunswick schools focuses on the intellectual challenges when discussing students outside the perceived norm. Absent in the document is the full range of learner such as those that are academically gifted, or those from different ethnocultural backgrounds to name a few.

In this research I define inclusion and diversity similarly to Policy 322. Inclusion means integrating the rich tapestry of students that could be defined through diversity in one classroom. Diversity encompasses the full range of ethnocultural backgrounds, socioeconomic statuses, academic abilities, and social capacities. In this sense, I look to

inclusion and diversity as interwoven – any potential individual who would attend school in New Brunswick shall do so in one common classroom environment.

**Historical Views of Inclusion**

Lipsky (1987) asserted that the initial focus of inclusion policies was on introducing students with *mental deficiencies* into regular schools. MacKay (2007) also found this to be true in New Brunswick, but with the broader term *disabilities*. Research at the time was focused on teacher and student perception, effective techniques on implementation, and general public discourse. Lipsky (1987) provided an initial analysis/review of Public Law 94-142, The Education for All Handicapped Children Act enacted by the United States Congress in 1975. Her initial findings showed that there was still need for improvement in the method by which exceptional students were provided educational service. In a follow-up paper in 2005, Lipsky (1987) stated that, "This early special education design was based on the belief that student deficits could be remediated by expending more money in small classes with specially trained teachers. After being 'fixed', the students would then be returned to an unchanged regular system" (p. 156). Lipsky saw a need for restructuring of the traditional classroom to accommodate a wider spectrum of students who would increasingly be present.

With a push to have all students in some sort of universal classroom, as defined by Lipsky (1987) the focus in the literature shifted towards how to incorporate the higher needs students into the classroom learning environment and enhance the educational context for all. Since the presence of exceptional learners would impact *regular* students,

questions regarding their views and preconceived notions about their new peers had to be identified first.

**Perceptions of Inclusion**

So, what are teachers' views/concerns regarding inclusion, and what were the students' perceptions regarding their newly included classmates? The lens that teachers view inclusion through would influence how they operationalize inclusion in their classroom. This would also be affected by the response from students already present in that classroom environment.

*Teacher views/concerns regarding inclusion.* Since teachers are the primary stakeholder practicing inclusive policies in classrooms, it is important to gain some awareness of their documented perspectives on inclusion. Many teachers "are not even convinced that being served in their neighborhood school is beneficial to the student with a severe disability, much less in the regular classroom" (Smith, 2000, p. 58). In some cases, there exists a difference between the perspectives of elementary teachers and secondary teachers. McHatton & McCray (2007) explained, "Responses indicate that early education majors have more favorable perceptions toward inclusion overall, yet both groups (early and secondary educators) are less amenable to inclusion for students with particular exceptionalities" (p. 30). For example, McHatton & McCray (2007) did note that elementary teachers expressed reservations about including severely disabled students, a feeling mirrored by their secondary school counterparts.

Becker (2008) provided a more quantitative analysis by surveying 2,763 teachers and administrators from 72 schools regarding their perceptions of inclusive educational

practices in their schools, organized into seven scales. Survey questions asked about the diversity of students taught, adequacy of staff development, support available from teachers and administrators, student involvement in various activities, and so on. The point was to minimize the teachers' beliefs regarding inclusion and focus on aspects that can be quantified. Becker's survey aligned with other research that found, "administrative support, time to collaborate, and experience with students with severe disabilities were associated with educators' beliefs about the benefits of heterogeneous education" (p. 68). Though Becker (2008) concluded that the relative preparedness for inclusion varied from school to school, she cautioned that this was an initial snapshot meant to guide further studies. Teachers see the benefit of cooperative learning when faced with a more inclusive classroom when it facilitates greater student voice, yielding a more engaging environment for all learners (Jenkins *et al.*, 2003).

***Students' perception regarding their newly included classmates.*** The attitude that students bring to each class when exposed to someone perceived as different than them, and thus their willingness to incorporate them, may have a significant impact on the success of an inclusive model. In one study, Shalev (2016) concluded that although the majority (63.3%) of students believed the appropriate setting for students with severe disabilities was a special education classroom, a higher percentage (92.9%) perceived benefits of learning to work with someone who is different than themselves. A literature review provided by de Boer *et al.* (2012) found that the majority of students held neutral attitudes towards students with exceptionalities, but cautioned that, "there were also students holding far more positive or far more negative attitudes" (p. 388). This finding

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shows that more work will need to be done with students who have reservations about inclusive classrooms.

**Documented Practices Regarding Inclusion**

Although each research paper reviewed presented its own unique findings, a few common themes emerged. The following represents some commonly addressed themes that were prevalent in most of the research. Since they were continually present throughout much of the research reviewed, they provide a framework through which inclusion can be analyzed.

*Universal design for learning.* As mentioned earlier, this concept has been advocated for by Meyer and Rose (2002) over the past twenty years. It began with a non-educational approach of universal design that applied to everyday objects (such as buildings) that are meant to be accessible to everyone. They assert that "brain activity occurs in roughly the same areas for most individuals performing a given task but that each individual has a unique signature of brain activity for that task" (Meyer, 2002). The implementation of curriculum is meant to be flexible to reflect each student's ability to learn, engage, and express their knowledge. Their argument is that the one-size-fits-all concept that has dominated education for years simply fails to reach certain students. With a greater understanding and ability to diagnose autism, this concept has gained traction. In the past, autistic students may have been labelled intellectually disabled, and sent down a particular path without recognizing their potential. As time has progressed, assistive technology has presented unique methods of reaching each type of student, especially those on the autism spectrum. For example, non-verbal students could use

tablets to act as their voice giving teachers insight into their understanding. It should be noted though that the language typically used in their writings reflect a view that inclusion is still focused on learning disabilities.

*Authenticity in assessment.* In recognizing the unique nature of each child's background and abilities, having assessment practices that are varied allows students multiple avenues to demonstrate knowledge. Villa *et al.* (2005) cautioned that decontextualized methods of recall through rote memory are not effective for most students and provide a potential detriment to students with exceptionalities. A variety of assessment opportunities also has the potential to benefit all students, not simply those on individual learning plans (Janney & Snell, 2006). A simple example would be providing choice for students to present a project to a small group, or to the teacher alone. This could be seen as an expansion on the work by Meyer and Rose (2002) outlining a Universal Design for Learning whereby there needs to be a flexibility in how students can demonstrate their understanding.

*Communication and collaboration between teachers.* Teaching and learning strategies need not be confined to individual subjects. Each teacher sees a student in a unique light and may naturally develop techniques that could apply in other classroom settings. Cramer et al. (2010) provided evidence of successful co-teaching in a middle school science classroom setting through pairing of teachers with special training for students with autism with non-trained classroom teachers. Both groups benefited from effective learning strategies which were tested on-site with students on their caseloads. The classroom teacher was given the opportunity to expand their practice by learning about strategies they could use and then observing it in action by another professional in their

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classroom. Even though this seems to be mentioned in the context of intellectually challenged leaners, it applies to anyone who would logically fit under the inclusion model. Teachers also reported that effective collaboration between teaching staff, support staff, and family members was an important component to prevent teacher burn out. Teacher views of inclusive classrooms became more positive when sharing the workload with other professionals (Pugach & Johnson, 1995). When roles were clearly defined and organized into an interdisciplinary model, everyone benefitted.

***Up to date professional learning.*** As the knowledge regarding special learners was expanded based on research outside of the classroom, most teachers interviewed expressed a desire to receive professional learning tailored to the classroom. Some identified concerns with colleges who were not up to date in current inclusive practices (Villa *et al.*, 2005). The main focal points were universal lesson plan design, differentiated instruction, and methods for addressing differences.

***Support from administration.*** As is the case for most issues in schools, having strong, supportive leadership is of the utmost importance. Administrators with a clear vision of inclusion in their leadership behaviours promotes inclusive practices by the teachers in their schools (Avissar *et al.*, 2010). It is assumed that supportive administration would be conscious of equitable distribution of students eligible for special education into every classroom (Cawelti, 1994). Principals and Vice-Principals provide the general direction that a school takes, and an inclusive environment is more easily attained when viewed as a priority by the school's leadership.

**Summary**

After reviewing the literature, I found it most interesting that the concerns that researchers and teachers alike share about implementing a fully inclusive model are very consistent across the United States and Canada. General classroom teachers are hesitant to take in students with moderate to severe exceptionalities as they feel underprepared to handle such an undertaking. The desire for administrators to acknowledge their concerns and take appropriate steps is found consistently and mirror the experiences I have had in various schools. Students similarly express concerns with including exceptional peers but recognize the potential benefit in learning to work with a variety of individuals.

What surprised me the most was the clear distinction between inclusion and diversity. These are consistently seen as mutually exclusive concepts by the majority of stakeholders, including the researchers conducting the studies reviewed for this thesis. Inclusion often referenced students with a variety of academic abilities, whereas diversity focused on ethnocultural differences. Most striking was that the potential steps forward are common: recognizing each person as a unique learner, and adjusting teaching/assessing strategies to reflect this.

In the next chapter, I will discuss my choice of grounded theory as the methodology for my research. I will also outline how this methodology was specifically employed in my research.

# Chapter 3: Methodology

## Grounded Theory

The positivist model that served as the foundation of scientific inquiry has been extensively used in the natural and social sciences, emphasizing a deductive approach where the purpose of the research is to test an existing theory. In contrast, grounded theory uses an inductive approach. Central to grounded theory as a methodology is the *absence* of an existing theory. Rather, through the iterative and recursive analysis of the data collected, a theory is derived from the data itself that best explains the process being studied (Glaser, 1998). This theory is under constant scrutiny because of the continuous re-entering of the study sites for additional data collection. Ultimately, this data is coded (sorted and organized) with the goal of further refining the theory emerging from the data. In this research, although I had my own experiences with inclusion as a practicing teacher, I genuinely did not know *how* inclusion was being implemented in schools across our province. My belief was that this information would be valuable for teachers, parents, administrators, students, and other stakeholders.

Deduction and verification *are* used in grounded theory, but are supplementary to the induction process. Deduction is meant to be used during the verification process, after initial data has been collected, analyzed and an initial theory presented. This theory is then checked for in a deductive fashion. The constant comparative model of data analysis is central to grounded theory, and was most clearly elaborated on in the work by Glaser and Strauss (1967). Glaser (1998) stated, "Built into grounded theory is its own constant verification through modifying by constant comparison" (p. 4). According to

Glaser, this gives grounded theory its power as a methodology – it is under constant

scrutiny. Even in the scenario where a researcher is being dishonest about the theory the

data purportedly supports, another researcher using this theory will quickly discover its

falsehood. Interestingly, although Glaser and Strauss initially developed (or

"discovered" as Glaser asserts) grounded theory together, their ideas of its

implementation diverged over the years leading to alternative explanations of its use.

***Role of the literature review.*** In many fields of qualitative research, a thorough review

of existing literature is an essential first step, conducted prior to the development of data

collection. Grounded theory takes a different approach in that the literature review is part

of an ongoing process that is to follow primary data collection. Although both Glaser and

Strauss acknowledge that it is nearly impossible for a researcher to enter a field with no

previous ideas or bias, their opinion of the role of literature review varies. Glaser (1998)

continues to hold that only the most cursory readings should be conducted, and only then

to expose the researcher to a richness of possibilities. If a literature review is required

(such as for grant applications), the data collection methods should be the focus. This is

meant to prevent the researcher from attempting to verify a pre-existing notion, at the

expense of finding the "truth". This is not to say that literature review is not important.

Glaser (1998) asserted that a review of similar research would be essential during the data

collection/development process. The emergence of patterns through coding that could be

compared to existing ideas act as a guide for the researcher to re-enter the field, this time

with the goal of verifying their assumptions. What is important to both Glaser and

Strauss is the avoidance of exposure to existing theories preventing the development of

new ones.

***Collection of data.*** As a type of qualitative research, grounded theory employs

techniques found in many other methodologies. Interviews of individuals experiencing

particular phenomena can be amongst the most useful. The interview should take a semi-

structured approach in that it gives the participants the ability to give their accounts

without excessive researcher influence (Glaser, 1998). However, given that the

researcher has a particular question to be addressed, it is incumbent upon the researcher

to provide probing when required. This borrows from effective techniques used in other

methodologies such as narrative inquiry and phenomenology. At this level, it is

important to have a richness of participants to maximize the diversity of data. Too

narrow a group (or too few participants) risks missing important ideas that could emerge

later on in the data exploration process (Glaser & Strauss, 1967).

Similar to other qualitative methods, the grounded theory approach employs an

ongoing data collection process during the research. The bulk of the data is to be

gathered in the initial interviews and observations, but confirmation/verification of ideas

can be accomplished by gathering new data through follow-up visits to each study

setting. This is where the deductive portion of grounded theory presents itself. In order

for a theory to "hold any water", secondary data can be paramount (Glaser, 1998).

Grounded theory also presents the possibility of combining qualitative and

quantitative methods of data collection and scrutiny. Glaser (1998) emphasized the

importance of viewing qualitative data and quantitative data as just that – data. In his

view, "all is data, from which theory can be generated through constant comparisons" (p.

42). Qualitative data collected can be analyzed quantitatively during the coding process.

This can take the form of frequency counts. By monitoring the number of times a theme

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arises, value judgments of something being important or significant can be made (Miles, Huberman & Saldaña, 2014).

***Coding the data.*** Glaser and Strauss differed in their opinion of the methods by which data is to be investigated. Strauss and Corbin (1998) describe a method of microanalysis where interview transcripts are taken line-by-line, phrase-by-phrase, paragraph-by-paragraph, allowing the researcher to speak for the data being analyzed as opposed to being forced. They contend that if multiple people read a paragraph, multiple interpretations can be considered. However, if those interpretations are compared, common themes may arise. It is these themes that are meant to be brought to light through microanalysis. Charmaz (2006) referred to this as open coding and stressed that although it would be a tedious process, early categories could emerge.

Conversely, Glaser firmly asserts that interviews should not be recorded as it interferes with the defining of the data. This view is not only contrary to Strauss' recommendations, but the majority of other qualitative methodologies that employ interviewing. He states, "taping neutralizes and undermines the power of grounded theory methodology to delimit the research as quickly as possible" (p. 108). In his view, grounded theory is meant to be fast and efficient not subject to the drudgery of excessive data analysis that transcribing requires. Reliance on a mechanical device prevents the researcher from developing a skill of immediate coding that can take place instantaneously during the interview process. He counters that field notes can be taken after the researcher has completed the interview. The impression they develop is more organic, and likely truer to the hypothesis that will emerge. This shows the fundamental difference that Glaser and Strauss have. Strauss maintained that different individuals

observing the same interview will have a variety of conclusions, which is problematic. Glaser argues this is the strength of "proper" grounded theory.

Strauss and Corbin (1998) identify the next level of coding as *axial*. At this level, the researcher is to find the links between the categories and subcategories identified earlier. It is described as investigating the phenomenon "that is, a problem, an issue, an event, or a happening that is defined as being significant to the respondents" (p. 124). It is here that the researcher is to get a true sense of where the theory may be going. The constant comparative analysis is essential, as early conclusions can begin if they stand after checking and rechecking. New data can be incorporated, either validating or invalidating the researcher's early notations of the phenomena.

The final stage is theoretical saturation. Both Glaser (1998) and Strauss (1967) identify this as a key point in the research process as no categories will have come to light with new data, or rigorous analysis of existing data. My sense is this can be a very troubling time for a researcher as this would represent a time where they need to commit to an idea and convince others that nothing else can be drawn out from the data. It also signals the time where data no longer needs to be collected. The theory is to have emerged by this point.

**Other Methodologies**

Though my focus will be on Glaser's (1998) view of grounded theory, an argument for other methodologies could be made. The exploratory nature of my research would not be conducive to experimental or quasi-experimental approaches as I am not looking at the impact of a treatment.

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***Phenomenology/Phenomenography.*** I believe the perceived experiences that teachers have regarding the implementation of inclusion is a phenomenon worth investigating. Initially described by Husserl (1931), a phenomenological approach to research requires "bracketing"; a removal of the natural attitude regarding the world around you. This is meant to emphasize the importance of removing the view that the world is objective, and can be studied without influence from the researcher's experience. Although this may be something that is very hard to achieve practically, I believe I can (must) use this attitude when conducting my research. I have conducted an initial literature review which is something that Glaser asserted would automatically place a bias on my research. However, attempting to employ a type of bracketing first could help me position myself when presenting my findings in my thesis. I am a teacher with a vested interest in the outcome of this project. Tilley (2016) asserted the importance of proper positioning, not only during the write-up, but prior to conducting the research. A perceived "insider" may be privy to additional information that a perceived "outsider" may not obtain.

Taking it a step further, I believe a phenomenographical approach is also appropriate. Unlike phenomenology, the phenomenographical focus is on the varied experiences individuals have with regards to the phenomenon. In my research, this could have been taken two ways. In one, I would focus on the varied experiences different teachers have with inclusion, and how it has been implemented. In the other, the actual student experience would be the focus, which may be even more telling for some people, as these are the individuals who are directly impacted by the policies and techniques employed.

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***Narrative Inquiry.***  A major component to my data collection was interviews with teachers regarding inclusion implementation.  Although there is more to narrative inquiry than interviews, effective interview techniques are a major field of study in this methodology.  Especially useful for my research is Mischler's (1986) model of active participants.  Riessman (2008) explained it in the sense that an interviewer must allow the interviewee to partially guide the interview in the direction they see fit.  Traditionally, an interviewer would have a particular end-goal in mind, and would seek it out through a focused line of questioning.  This linear view can be quite limiting as the interviewer may not be aware of some of the features that the interviewee deems most important.  By adopting a semi-structured model, there is greater assurance that the actual story that the interviewee wanted to convey would surface.  As I concluded in the initial literature review, having voices of teachers, and other stakeholders, was critical for successful inclusion implementation.  By focusing on teachers specifically, my hope was to have the story of the people actually *in the trenches* of the classroom illuminated through my research.

***Case study.***  I visited seven schools in Anglophone School District – West to collect my data.   It could be easily argued that each one of these schools represents a unique case study of the implementation of inclusion at that particular school.  Tellis (1997) describes a variant called exploratory case study (initially proposed by Yin in 1993) as, "fieldwork, and data collection may be undertaken prior to definition of the research questions and hypotheses" (p. 7).  The notion of undertaking data collection prior to hypothesis development is a central tenet to grounded theory.  In this manner I would argue that my research methodology blends into this particular model.

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***Why Grounded Theory?*** In this section I demonstrate how grounded theory is the best

methodology for the study I conducted.  Its features of recursive data analysis, emergent

theory creation, and focus on process all dovetail nicely into the research question driving

this study: How do New Brunswick teachers implement inclusion in their secondary

science courses?  It is the *how* that drove my decision to employ grounded theory.

Phenomenology aims to describe a phenomenon in great detail, whereas grounded theory

constructs an explanation of how a phenomenon exists. (Charmaz, 2017)  Narrative

inquiry looks to stories and describes their parts, whereas I want to explain how

something is operationalized.  In the Research Method section that follows I discuss how

I conducted the study beginning in the fall of 2017.

**Research Method**

The major question to be answered was, "How do New Brunswick teachers

implement inclusion in their secondary science courses?"  This was the focus of the

research, divided into four different phases.

***Phase 1: Introduction to potential participants.***  Beginning in early October, I visited

seven schools in Anglophone School District – West.  My goal in visiting the schools in

person was to speak to the staff directly, giving me the chance to assuage any concerns

that initially arose.  This resulted in all teachers contacted agreeing to be part of the

research. I chose these schools in the attempt at a sampling of both rural and urban

schools, both large and small.  Ideally, a larger sample taken from additional schools

across the province in other school districts would be a better representation; however,

the logistics of such an endeavor were not realistic in my timeline.  However, a sample of

ten teachers yielded sufficient data to draw from, comprised of two to three teachers from the larger schools, and one from the smaller schools.

***Phase 2: Interviews, classroom observations, journaling.*** Over the course of early October to mid-November 2017, I began my initial round of interviews and classroom observations for those willing to participate. The interviews took a semi-structured format to give the teachers the ability to have their voice heard, but also focus the interview in a direction that is useful for the intended research question of how New Brunswick teachers implement inclusion in their secondary science courses. Mishler (1986) asserted that the real narrative can be found when the interviews go off on tangents. This required a very active monitoring on my part, as this kind of interview can quickly devolve into an airing of grievances. Although their concerns are of the utmost importance, I wanted to accurately portray their context without serving as a sounding board for complaints. Question topics included provincial/district/school based professional learning, teacher background (prior exposure to inclusion through their educational training), student composition in their courses, interaction with educational support staff (guidance, methods and resource), interaction with other teachers, parent involvement, and other resources, and ultimately how all of these can be justified with the model outlined by Policy 322. See Appendix A for a copy of preliminary interview questions. Classroom observations were made at this time to monitor the execution. I also requested that participants maintain a brief daily journal of no more than one page per entry outlining their experiences/thoughts regarding their attempt at implementing inclusion for a period of one to two weeks. This gave me the opportunity to speak with

each teacher twice (in most cases during their hour-long preparation period) and have a minimum of one full class observation.

*Phase 3: Initial coding.* I utilized a hybrid of the Glaser (1998) and Strauss-Corbin (1998) approach to interviewing techniques by recording the interview followed by a full transcript (in line with Strauss-Corbin) but also maintaining a field notebook (in line with Glaser). In order to ensure that I had truly caught the essence of what a participant was saying, I transcribed the entirety of the interview line-by-line on my laptop, without the use of assistive technology. The notebook served as a means of capturing the emotion of the interaction. Though I believe a theory can be developed by some researchers without transcription of interviews, I wanted the ability to refer to conversations I had with teachers that would have occurred months prior. From mid-November to early-December 2017, I began the initial analysis of the data by employing the coding techniques outlined earlier with the goal of identifying common themes. These initial patterns or themes from the first round of data analysis were the starting point for the second round of interviews with each participant that took place in mid-December. At this point the literature was used, as described by Glaser (1998), to inform the development of the central theory being developed from the data.

*Phase 4: Interviews and classroom observations, round 2.* After identifying common themes that arise, and the development of an initial theory, I reconnected with all participants from the first set of interactions. This took place during a three-week period in December 2017. The interviews continued to follow a semi-structured approach with a focus on the themes that were derived from each participant in the first round of data collection and that contributed to the central grounded theory beginning to emerge from

the data overall.   Interviews were not recorded at this time as direct transcripts were not required for the intended purpose or member checking by revisiting participants.  Having taken steps to gain my participant's trust previously, I wanted to ensure that I represented them faithfully while also fleshing out the nature of inclusion in their classroom.  By using an iterative process, I was certain that no new themes had emerged and saturation of data had been reached.  By finding the connections between core themes, a theory had emerged.

**Delimitations**

Ideally, I would have the opportunity to visit all high schools in New Brunswick as Policy 322 is a province-wide policy.  However, the logistics of such an endeavor would not be realistic for my thesis.  I chose seven schools in New Brunswick that are easily accessible for myself and that represented a good cross section of Anglophone West School District.  Four schools represented the smaller communities in this district with an enrollment around 150 students which contrasts nicely with larger schools with over 750 students.  This allowed me to see whether there is a significant difference in inclusion practices based on demographics.  I allowed for a data collection window of two months.  I believe this permitted me the time to see the participants' classrooms more than once, to analyze the data recursively, and to perhaps observe different units of study.  All secondary school grades, 9-12, were observed.  The three levels of course, 0, 1, and 2 were also observed.

**Trustworthiness**

Shenton (2004) outlined four aspects that need to be satisfied for qualitative research to achieve trustworthiness: credibility, transferability, dependability, and confirmability. It is my belief that the clear explanation of choice of grounded theory, appropriate literature review, incorporation of additional research methods, and establishment of potential researcher bias found in this thesis more than meets these requirements.

*Credibility.* This study displays credibility in its use of a well-developed methodology of grounded theory, primarily outlined by its founders Glaser and Strauss (1968). There are three different data collection techniques, allowing for triangulation of the data. Potential limitations of a single data collection technique can be addressed by employing other methods.

*Transferability.* My selection of seven different schools of various sizes and community background allows for the application of the results in other parts of New Brunswick that were not observed directly. Having ten different teacher perspectives provided a richness of data such that the results could be seen in other schools. However, it is important to be cognizant of the fact that schools with different leadership and different pedagogical priorities may have an entirely different feel in their classrooms.

*Dependability.* For a theory to emerge in grounded theory, saturation must be reached. The lack of new categories drawn from multiple data sources increases the likelihood that another researcher, conducting the same research with the same participants would draw similar conclusions. Glaser (1998) emphasized this as a strength of grounded theory in

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that if a researcher was to falsely state conclusions by the data, it would quickly become evident by another researcher analyzing the same data.

*Confirmability.*  My choice to avoid a thorough literature review specifically regarding secondary science courses provides a level of objectivity.  Without pre-conceived notions derived from previous research, I was free to draw conclusions as unbiased as was possible from a teacher in the school system being studied.  By not gathering data from my own school, I was provided with a level of objectivity that would be challenging when observing colleagues, many of whom I consider friends.

**Summary**

The decision of New Brunswick politicians to commission two large scale studies regarding inclusion within a six-year period demonstrates its importance in education. The current culmination of those works, Policy 322, provides what is believed to be the best-practices approach to inclusion, as recommended by these studies.  All teachers are expected to prepare their courses with this policy front and centre, and can be held accountable to do so.  Secondary science courses are traditionally taught in a manner that is unique in comparison to other disciplines but are no less required to be cognizant of the purview of the policy.  Thus, my research question regarding how New Brunswick teachers implement inclusion in their secondary science courses is of the utmost importance to all secondary science teachers.  The answer to the question is not only important to these teachers, but all other stakeholders in this endeavor, the most important of which are the students themselves.

# Chapter 4: Analyzing the Data

My model of grounded theory took aspects of advice from more than one leading researcher in this methodology. By conducting interviews, observing classrooms, and reading through teacher journals, a plethora of data was presented to me, though some proved more useful than others. As I will outline in this chapter, I undertook steps prior to sitting at my desk, mining through the data to unearth themes that would emerge in the later stages of my research. Figure 1 provides an outline of the levels of analysis I applied to the data. Descriptions of decisions I made in each follow. In addition, the following is a list of the pseudonyms of participants in this study, the size of school they taught in, and range of years of experience in the teaching profession.

- David, 15-20 years experience, small school
- Emma, 15-20 years experience, small school
- Jason, 25-30 years experience, small school
- Julia, 20-25 years experience, large school
- Kyle, 20-25 years experience, large school
- Lori, 10-15 years experience, large school
- Michelle, 25-30 experience, large school
- Natalie, 5-10 years experience, large school
- Stacey, 20-25 years experience, small school
- Trevor, 0-5 years experience, large school

**Triangulation of data**

| Interviews | Observation of class teaching | Journals |
|---|---|---|

Primary Data Analysis

Data were reviewed and cross-referenced with field journal. Emergence of nascent themes.

Secondary Data Analysis

Axial coding. Initial 21 themes compressed to 10 categories.

Tertiary Data Analysis

Common features of each category found in three major themes. Combined, these provide the creation of a three-part theory.

**Figure 1: Data Analysis Model**

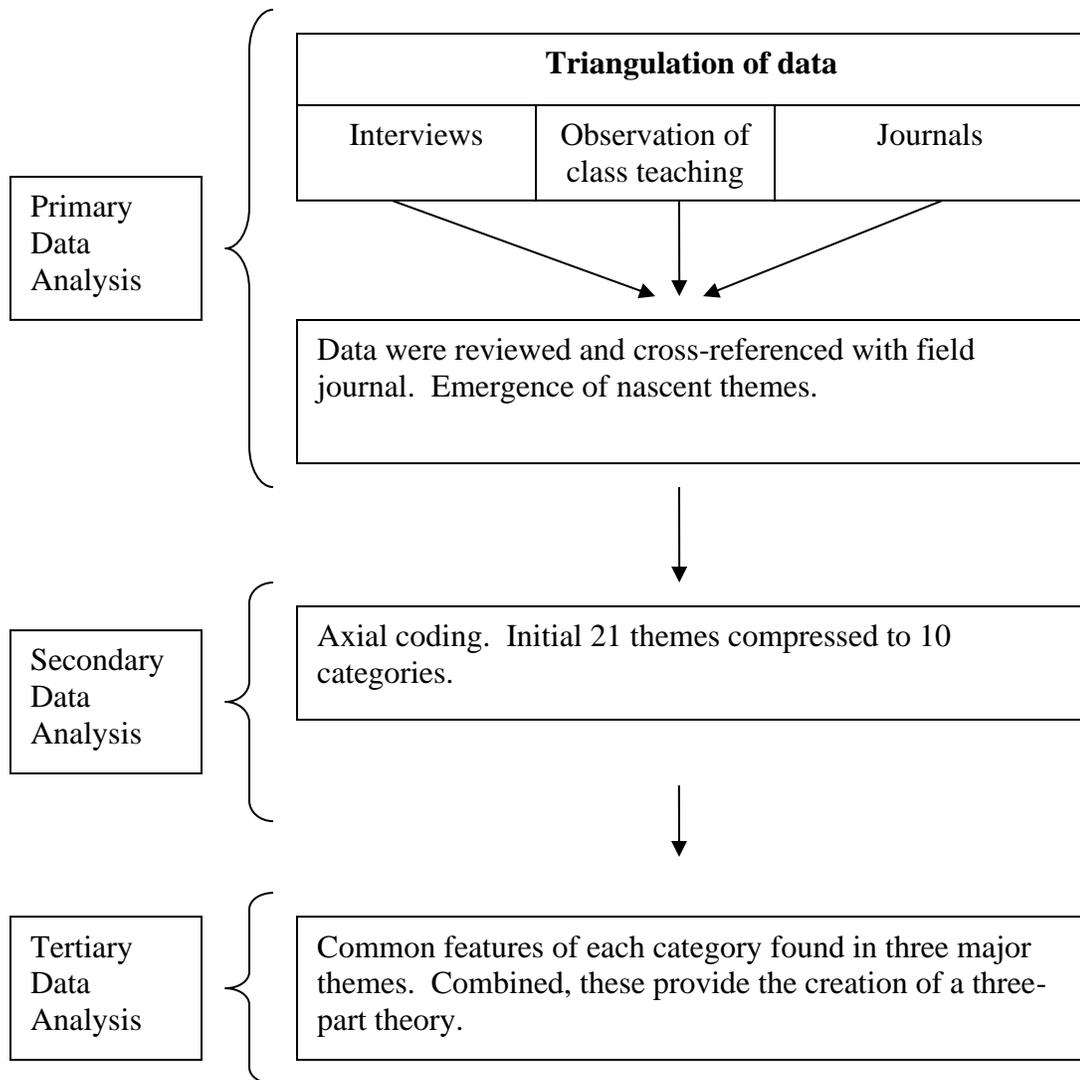The choice of each data type was explained in Chapter 3. Each provided a different lens through which I could observe the execution of inclusion in science courses. What proved interesting was the alignment of what was brought up in interviews and what was observed during the teaching process. What participants claimed to be a social reality in their classrooms was often, but not always, the case.

Having the opportunity to only observe one day of classes would limit my observations, whereas an interview allowed for a participant to draw from months and years of experience. I wondered whether the keeping of a reflective journal would have an effect on the teaching process. If teachers were asked to consciously analyse their inclusive practices, would this change how they would otherwise teach?

The interviews took a semi-structured approach and were not conducted immediately upon arriving in the participant's classroom. My intention was to lower any anxiety someone may have with participating in an interview that surrounded the execution of their daily work life. I was hopeful that the decision to conduct each interview would raise the comfort level of each participant as it was their space. Stern and Porr (2011) acknowledged the challenge in eliciting information from complete strangers. They offered, "think of your participants as your teachers and yourself as their pupil" and to "Present your human side" (p. 53). Each interview began with casual banter about the school year, or at times matters unrelated to the teaching profession. Again, as this interview brought to light sensitive topics, I wanted to maximize comfort. I reminded the participants that this was not meant to be a judgment of their practices, but rather a candid insight into inclusion in our province. I believe being a fellow teacher helped in this manner as the feelings of *outsider* could be minimized. Corbin-Dwyer and Buckle (2009) contend that a benefit of being a member of a group being studied is the willingness of participants to share experiences because of an assumption of shared distinctiveness. Indeed, this form of data collection proved to provide the richest data. As the interviews progressed, each participant appeared as though this was something they needed to discuss with emotions like anger or sadness rising to the surface. In

retrospect, this was not surprising as every teacher asked to participate answered yes. I explored areas that appeared to evoke the most emotion in each participant, but I was cautious to not allow the interview to degrade to a session of airing of grievances.

The classroom observations were on the same day as the interviews for each participant. I asked the participant to decide where I should remain while in the classroom, attempting to be as unobtrusive as possible. Some participants elected to introduce me as a guest and explained my purpose, others made no mention. I am certain this had an influence on the behaviour of some students as some would dart glances in my direction on occasion. Did they see me as another teacher in the room that had some authority? For some, I was encouraged to sit with the students, while other suggested their own desks. I also questioned the authenticity of the teaching process I observed on that day – would the participant put on a performance knowing they were being observed? Many were candid in whether this reflected a typical day or not, most asserting that it was. This data source allowed the most visual representation of how teachers implemented inclusion. I could not only see what the teachers were doing but could observe the students' response to all of it.

On the surface the reflective journals provided the smallest volume of data. Many participants provided brief insights of their daily interactions, a paragraph at most. However, what this lacked in quantity, it was made up for by quality. When I collected these journals, many participants apologized with explanations of, *It was a busy week*, or *I only got around to it by the end of each day*. This could be taken that it had less of a priority for the participant, but I also considered that if they chose to write about something, it must be significant to them. Some entries were about particular interactions

they had with students, while others were more reflective of their feelings towards

inclusion in general.  When comparing these sentiments to the interviews, the journal

entries had a habit of expanding on topics that were of importance to each participant.

Ultimately this allowed me to begin the process of finding categories and themes.

**Primary Analysis: Modified Open Coding**

Though I lacked the confidence to avoid transcribing the entirety of interviews, I

found Glaser's advice (1998) of keeping a field notebook to record thoughts of each

interview useful.  At the completion of each interview and upon entering my vehicle

when leaving a school, I took notes about the general feeling of each interaction.  I was

concerned about forgetting the more subtle features of our interactions, such as feelings

that would be hard to convey later.  My intention was to transcribe each interview

personally, but the recordings may not capture the full extent of the interview.  These

notes also included additional questions that came to mind that I hoped to address during

the member check.  I was cognizant not to include these questions in interviews yet to be

completed and avoided bringing up these thoughts to participants that had not been

interviewed at that time.  My concern related to influencing future interactions,

inadvertently guiding interviews in directions that would not have occurred otherwise.  I

was not interested in having each participant merely confirm what their colleagues felt as

that would introduce bias that would compromise the integrity of my conclusions.

Regardless, these bouts of what felt like a form of verbal vomiting provided several

initial themes.  These initial themes would be distilled further when connections between

them were found.  I achieved this after the slow process of transcription.

*Decision to Transcribe*

I followed through with the intention of fully transcribing each interview personally. I considered hiring a professional to transcribe the interviews, but I believe I could glean extra meaning because of the interview emotion mentioned earlier. Lacking prior transcribing experience, this proved to be an exercise in both tedium and frustration. The sheer number of filler words like 'um' and 'uh' was maddening at times, but I believed it could convey hesitation and thereby additional meaning in a participant's answer. I kept my field journal on my desk next to me while transcribing, noting tone and inflection that would otherwise be lacking in a simple transcription. Participants became quite animated at times during our conversations and I believed this to be a form of unspoken data that could not be conveyed through text alone.

As an extra layer of analysis, I played back the recording of the interviews and wrote down what I believed to be important concepts to each individual. I repeated this process several times, often playing them on my drive into work and recording ideas upon arriving at my destination. I reread both my observations of the teaching process, and the reflective journals. Again, I recorded my interpretations of the importance of these data. These rounds of data analysis lead to 21 nascent themes:

- Lowered expectations in a more academically diverse class

- EA support is essential but lacking

- Students on PLPs (personalized learning plans) grouped in separate spaces in classrooms

- Some teachers lack proper science background leading to less rigor of material

- Professional learning is not continuous

- Student attendance impacts ability to cover material

- Student mental health impacts ability to cover material

- Presence of students on PLPs limits hands-on activities or labs

- Purposeful teacher selection by those making schedules is prevalent

- Teachers demonstrating competency in diverse classrooms have unequal workloads

- Co-teaching with specialists is effective

- Large number of students is more impactful on diverse class rosters

- Dedicated time to meet with M&R teachers is necessary

- Teachers triage their time to students who have higher social needs

- Distrust of officials from district or department

- EAs lack of proper science background limits use academically

- EAs have priority to one student

- Safety of students is impacted by presence of certain students

- Sacrifices of the many for the needs of the few

- Teacher expectations in handling student mental health is increasing

- Administrators' role is purely disciplinary

Gaining confidence in my familiarity with the data, I moved on to the next level of coding recognizing there must be connections between these ideas.

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**Secondary Analysis: Delving in Via Axial Coding**

  Having 21 nascent themes as a starting point allowed me to begin the iterative

process of revisiting my notes on the interviews, classroom observations, and reflective

journals.  At this point I sought to achieve an early form of saturation where no new

themes would emerge through constant comparison.  My intention was to find features

that connected these themes into more generalizable categories.  It occurred to me that

how teachers implemented inclusion was primarily influenced by factors that were within

the classroom itself or by those outside of the classroom.  For example, student

attendance would directly impact the classroom environment on that day, whereas the

lack of continuous professional learning opportunities was the result of something that

took place outside of the classroom.  This allowed me to combine and reword some

themes that were effectively describing the same concept.  I elected to re-analyse the

data, colour coding for each category to ensure that no additional themes would emerge.

This resulted in an extensive colouring project but gave me a visual of where all the data

would fit.  The linkages between nascent themes began to emerge resulting in a reduction

to 10 major themes:

    1) Large schools versus small schools

    2) Grade and level of course

    3) Non-random PLP distribution

    4) Meeting time with other teachers

    5) Delivery of professional learning

    6) Turn around time between semesters

    7) Presence of educational assistants facilitating exclusion

8) Comfort level with science

9) Educational assistant roles

10) Student mental health concerns

Each of these themes had a direct impact on how teachers implemented inclusion. Many were evident from the interviews; others revealed themselves during the classroom observations. The reflective journals served to confirm data that were evident in the other two forms of data collection.

**Tertiary Analysis: Emergence of Themes**

The goal of this research was to explore how New Brunswick science teachers implement inclusion in their secondary science courses. The 10 categories that resulted from the iterative process of data analysis may feel disjoined to the uninitiated reader and would not convey the message I intended. Although I initially had two major themes that each category could fall into, I felt there was something lacking, that this would not accurately describe what influenced the execution of inclusion in science courses. I elected to go into slightly more detail of the connections between the 10 categories identified earlier, resulting in three major themes.

The first was **classroom composition**. This theme describes factors that influence the kind of class roster a science teacher could have but would have no direct control over. The categories that fit into this theme would be set before the first class of the year, but would carry on through the semester. This theme emerges in categories 1-3. Participants often brought up the widening diversity of students as a concern, and a facet that impacted how they implemented inclusion. How diversity was defined was
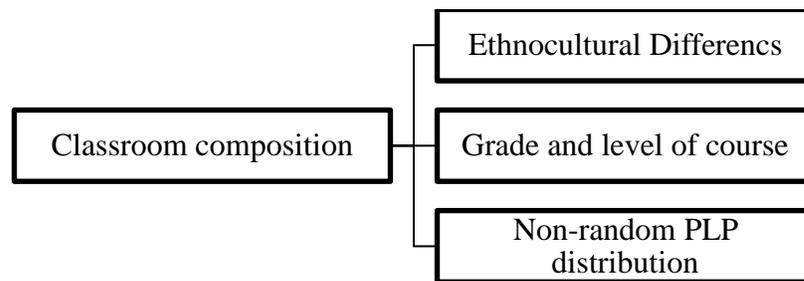
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dependent on factors like school size, grade level taught, or academic level of the course. Regardless of the source, participants identified challenges in meeting the needs of increasingly diverse student populations. The common thread was that teachers had no control over the group that would be in attendance, despite that having a major impact on how they implemented inclusion in the science courses.

The second was **planning time**. Like classroom composition, this theme involved categories that discussed matters outside of the actual teaching of the class. This theme emerged in categories 4-6. Unlike classroom composition, teachers began to gain a limited amount of control. There is a wealth of resources available to teachers in the form of other professionals in a school, including other classroom teachers, M&R (Methods and Resource) support staff, or EAs. M&R teachers are specialists in schools who work specifically with students with exceptionalities. Collaborating with these individuals helped teachers prepare for a diverse class roster and was often cited as a primary source of support in the more challenging scenarios. For example, sharing a student with another classroom teacher, regardless of subject matter, allows teachers to having ongoing conversations where they can share notes on effective strategies. The limiting factor was the time given to have these conversations or collaborations. Without dedicated time to meet with these individuals, it was identified as a challenge to find the time throughout a typical busy day.

The third theme was the **execution of daily lessons**. Categories in this theme described matters that happen on the day-to-day basis for a teacher as the semester progressed. This theme emerged in categories 7-10. Of the three themes that emerged through recursive analysis, this is where teachers have the most autonomy. If an EA is

present in a class, they can have a significant positive influence on how a teacher reaches

the needs of a diverse classroom. Similarly, the absence of an EA can have a significant

negative impact as evidenced by the feeling of dread some participants identified when

an EA assigned to their class called in sick and a replacement could not be found. This

dichotomy between presence and absence also manifested in the students themselves.

For example, when a student on a behaviour-based PLP is absent for a day, this frees up

the EA assigned to that individual, allowing the teacher to have the EA facilitate group

sessions for individuals who require academic support.

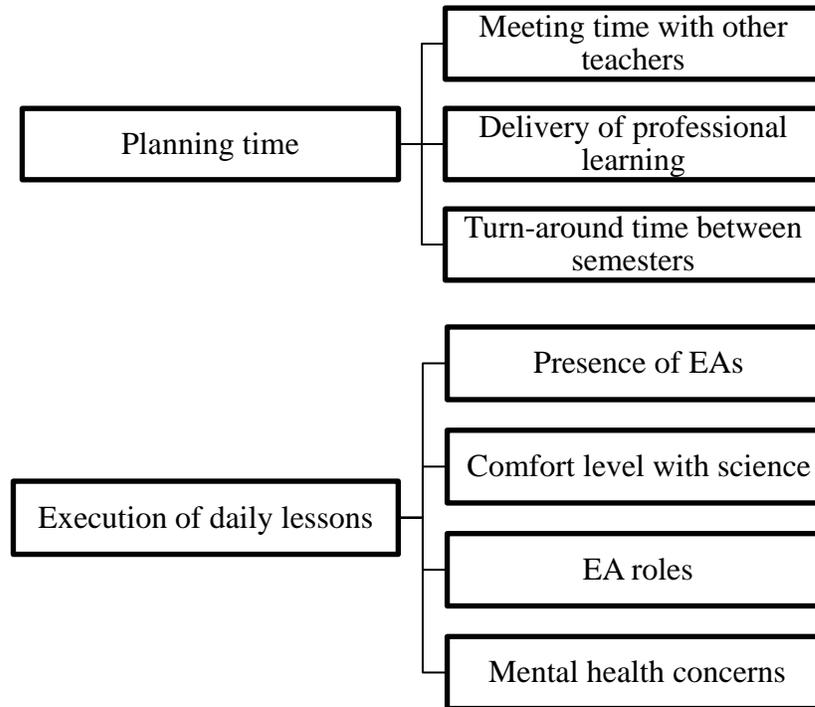The following page presents a visual summary of the categorization process.

| | Ethnocultural Differencs |
|---|---|
| Classroom composition | Grade and level of course |
| | Non-random PLP distribution |

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                              ┌──────────────────────────┐
                              │   Meeting time with other│
                       ┌──────┤        teachers          │
                       │      └──────────────────────────┘
┌──────────────────┐   │      ┌──────────────────────────┐
│  Planning time   ├───┼──────┤ Delivery of professional │
└──────────────────┘   │      │        learning          │
                       │      └──────────────────────────┘
                       │      ┌──────────────────────────┐
                       └──────┤ Turn-around time between │
                              │        semesters         │
                              └──────────────────────────┘


                              ┌──────────────────────────┐
                       ┌──────┤      Presence of EAs     │
                       │      └──────────────────────────┘
                       │      ┌──────────────────────────┐
                       ├──────┤ Comfort level with science│
┌──────────────────────┐      └──────────────────────────┘
│Execution of daily lessons│  ┌──────────────────────────┐
└──────────────────────┘──────┤        EA roles          │
                       │      └──────────────────────────┘
                       │      ┌──────────────────────────┐
                       └──────┤  Mental health concerns  │
                              └──────────────────────────┘
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**Figure 2: Creation of Three Core Themes**

These three themes are not in any particular order of importance. Rather, they represent

three unique pressures teachers contend with when implementing inclusion in their

secondary science courses. To fully understand the process that teachers employ when

faced with a diverse class roster, each must be considered. In the next chapter, I delve

into each category in detail, providing specific examples of the implementation under

question.

# Chapter 5: Results

The first of the aforementioned categories is classroom composition. Though it falls outside of a teacher's direct control, this nonetheless has a direct impact on how a teacher will engage their class. The typical composition of students varied based on the size of the school, and the grade level within the schools. The demographic challenges for teachers in large schools (over 750 students) were quite different at times than those in small schools. Consistently in large and small schools however, was the drastic difference between Grade nine/ten courses, traditional 'hard' science courses that are offered as level 2 or level 1, and the wide spectrum level zero courses. The distribution of students on PLPs was uneven in many cases, with a small number of teachers shouldering the majority of the load. Although this can be attributed to simple random distribution of students, teachers were aware of direct attempts to increase the number of students on these plans to teachers who had demonstrated proficiency in the past. Finally, student attendance problems was a consistent theme in all schools. Expectations on teachers of how to handle the missed time added to teacher workload yet would not necessarily lead to meaningful change for these students.

The second category addressed the time teachers had to prepare or plan for their courses. Meetings with auxiliary teachers (such and Guidance or Methods and Resource) were often sporadic and conducted outside of a typical teacher's workday. Professional learning (PL) days were rarely spent in a manner most teachers would deem useful for their day-to-day operations. The time between receiving a student roster for a course and the beginning of the semester was often very short, limiting the time for teachers to prepare for individual needs.

The third and final category concerned the actual daily execution of lessons. The numbers of educational assistants (EA) had been deemed insufficient and had a direct impact on how teachers conducted their classes. The abstract nature of certain topics in science often meant that the available EAs were not well versed in the material and could provide limited support as a result. High composition of varying learners meant that teachers had to resort to groupings amongst students based on academic level, much to their dismay.

In the following sections, I will deconstruct these categories, providing both direct and anecdotal evidence. In order to fully explain each of these aspects, I will first elucidate the reality faced by teachers implementing inclusion, followed by details of how it is operationalized.

**Classroom Composition**

Teachers wait with great anticipation at the beginning of every semester to learn of their course rosters. This is because it has a direct impact on the classroom environment they will be presented with on a daily basis yet have no control over its creation. Factors such as the size of the school, the grade level of course being taught, and PLP distribution were the major contributors to the overall look of a roster.

*Ethnocultural differences in large and small schools.* Teachers in large schools consistently saw a more ethnoculturally diverse population than their small school colleagues. Due to their proximity to urban centres, new Canadian students were more likely to attend these schools. Small schools presented a far more culturally homogeneous population, with the new Canadian, or English as an Additional Language

(EAL), numbers totalling one or two at most, per class in the small schools in the study. Teachers feel that the addition of new Canadians places an additional burden on a system already struggling to meet the demands of its students. Compounding this issue is that EAL students have a wide range of learning abilities, just as any demographic does. Unlike English-speaking Canadians though, there is no Methods and Resource (M&R) support for these students. Natalie (pseudonym), a teacher at a large high school, addressed this. Although Natalie's school is large, it has not experienced an influx of new Canadians as much as other large schools. This has been changing in the past five years as more and more new Canadian families arrive in New Brunswick to address job openings that have not been filled locally. Natalie expressed,

> We have these new students, but we're barely prepared as is. You just know that some of the students you see in your class who are learning English for the first time have learning challenges. How are we supposed (to) identify that when our M&R people aren't EAL specialists too?

This inability to identify the specific needs of these students leads to high failure rates, without a clear plan on how to help these students succeed. Teachers feel as though their role is expanding in that they are evolving into language teachers, in addition to their discipline in science. Many express discomfort in this manner as they have not been formally trained in the teaching of languages, nor does their university background reflect any substantive coursework in this field.

The increase in cultural diversity also influences the manner in which teachers convey scientific concepts. Science teachers often make use of analogies to help students grasp ideas that can be abstract by their very nature. A wider selection of cultural

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backgrounds takes away from the effectiveness of this technique as EAL students lack the cultural capital to fully engage with the idea the teacher is presenting. Trevor (pseudonym), a teacher at a large, culturally diverse high school has experienced this firsthand. Trevor's school has traditionally had some of the most culturally diverse student populations and has grown in the past decade. He offered, "Every time that I come up with a lab or an activity of some sort, at the forefront of my mind is always, okay, how is so-and-so going to handle this? And then I have to kind of fine tune it". At another large school, Kyle (pseudonym) faces the same issue. "Every assessment I have now I'm questioning whether the language is appropriate for the EAL students. How much material contains references to things that only students born and raised in Canada would understand?" Students can struggle with new material in science under ideal circumstances, and a lack of a common reference point prevents deeper understanding of the material. This means that teachers must take the additional steps to look at their questions not only through a science lens, but also through a language lens. This requires an understanding of the scaffolding students have prior to taking that science course. Teachers are willing to present alternative analogies, but feel they have no clear avenue on how to pursue this. Without training on language-based instruction, they are left to a means of trial and error. Trevor laughed about a situation where a student had a question about a physics problem they were solving. "He asked me, 'Sir, what is a dragstrip?' To Trevor, the question was clearly about a car accelerating, but that word was unfamiliar to the student, and they felt as though they could not solve the problem without addressing that first. That opened my eyes a bit". Trevor readily acknowledged that this was

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something that had a local colloquialism slant to it, but was now aware of the need to go through all his material critically to check for language issues.

Group work is a tool that is used in many science lessons. The increase in cultural diversity presents a unique challenge in executing this technique. Teachers are concerned that their lack of knowledge of subtle, or even overt, cultural expectations will lead to tension between classmates. Trevor described a situation where a Syrian female student express her tremendous discomfort in being paired with a male for a group activity. She explained that she was not supposed to speak to males who were not related to her (like a brother or father) and was concerned what her family would think of this act. This was easily addressed by changing partners, but the fact that this happened midway through the semester caused Trevor to wonder how often this happens without his knowledge. How many cultural expectations of interactions was he unaware of?

Small schools in New Brunswick are relatively unaffected by the influx of New Canadians. As a result, teachers in these small schools dedicate far less time toward preparing for the ethnocultural differences that would necessitate alternative lesson planning. Many teachers of these small schools believe that they are unprepared for rising numbers of these students yet feel as though it would be beneficial to their existing student population. David (pseudonym), a teacher from one of these small schools explained, "I think it would be welcomed by a lot of people. Because with the lack of diversity, I think a lot of our students don't realise how close-minded their beliefs are". He went on to explain that this would likely be a bumpy transition, but the local community would grow literally and figuratively as a result. However, like his colleagues in other small schools, he feels as though the school district would have to

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provide some sort of teacher training to prepare the staff. With limited resources available to every school, this could mean cuts to other areas and he did express concern that this would potentially create an antagonistic relationship between New Canadians and the existing population.

Though the potential complications of wide ethnocultural diversity are not prevalent in small schools, the lack of other supports can be problematic. Whereas larger schools have funds for things like alternative education programs (sites where students struggling in a traditional classroom setting can complete their course work at their own pace), school nurses, and police resource officers, small schools simply do not warrant their existence. David continued, "you get a mental health referral; we can't drive our kid to mental health, we can't get there. Okay, there you go, done". David went on to explain that in that situation, the part-time guidance councillor would have to make plans for these students that teachers would have to implement. This means that teachers would have to act as councillors themselves, being cognizant of that fact that they are now the front-line worker for these students. Teachers and school administrators must contend with the kind of issues that would not be present in a larger school. A student who struggles in a traditional classroom setting cannot apply for alternative education programs, leaving the classroom teacher to attempt to make do in their own courses.

Small schools also see the potential of having students with very high needs placed in academic courses due to a lack of scheduling flexibility. Stacey (pseudonym), a teacher at one of the small schools I visited, described a grade twelve chemistry class that had two students on individualized education plans (IEPs) on her roster. Students on IEPs are those who have been deemed incapable of reaching the traditional outcomes in

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any typical age appropriate curriculum; they have outcomes tailored specifically to their learning. When asked how she included these students in an academic class such as chemistry, Stacey offered, "we try to do a little Chem, a little Math, which is not my responsibility, and sometimes the EA will do some type of wood activity. Like they might go to the shop. So, it's just that period, they're under my umbrella". In this situation, Stacey must prepare unique lesson plans for these students that are in many senses totally unrelated to the subject matter she is teaching. Stacey described using online resources to prepare colouring sheets, or material for the EAs to read to them. Stacey was not the only teacher I observed employing this practice: being asked to prepare material that is not merely another way of learning the given curriculum, but rather an entirely personalized lesson plan for students who simply could not process the information given to their more academically typical classmates. In these classes, teachers must effectively prepare for two entirely different outcomes to be taught on any given day. As Stacey described, this often looks like "make work" material that will keep the students on IEPs occupied while teaching the course material to the remaining students.

As was observed in other situations, these students were also physically separated from their classmates, as they required constant one-on-one support with an EA, making their physical inclusion a logistical challenge. In this sense, inclusion manifests the presence of these students with their peers, but their actual interactions are limited to situations where there is some common ground they can meet on. In highly academic science courses, those opportunities may be limited.

*Grade and Level of Course.*  A theme that was primarily school size independent was the

grade level and the course level being taught.  New Brunswick high schools cover Grades

9 through 12, though science is only mandatory for Grades 9 and 10, presented as

Science 9 and Science 10.  Beyond those, students are required to complete one science

course at the Grade 11 or 12 level to be eligible for graduation.  At these grades, there are

three further classifications of courses, level 1 (advanced university preparation), level 2

(university preparation) and level 0 (open to any student).  As an example, a Physics 121

course would typically be selected by students who are in Grade 12 and have a desire for

advanced topics prior to entering university, whereas a Biology 112 may ben selected by

students intending to apply for university, but have no need or desire for the advanced

material.  Conversely, students of any academic background, including those who merely

need to complete any science course just to graduate, may select an Environmental

Science 120.  Recently removed are the level 3 courses that would take a more general

approach to the material covered and would not satisfy requirements for entry into

university programs.  As a result, many teachers felt that level '0' courses have defaulted

into catch-alls, with less than desirable consequences.

The breadth of science courses taught in a typical high school in New Brunswick

has led to teachers experiencing vastly different approaches to their courses.  Teachers of

Grade 9 and grade 10 science courses approach each course with a similar tact to those

who teach level '0' courses. The open nature to these courses means that composition

can vary greatly from one section of a course to another.  In some cases, teachers could

be faced with upwards of ten students on PLPs, along with the potential smattering of

EAL students.  Yet, the same teacher may have the same course at a different period

during the day, and only have three PLP students with no EAL learners. Teachers expressed frustration with this reality in that it impacts how to deliver the same material to very different rosters. David wondered, "how many lessons can a teacher provide out there in one session? Without it breaking down to the point where they're not worth the paper it's written on. You're handing out worksheets, or whatever". He continued, "am I going around every lesson and indicating what each student is supposed to be learning that lesson? Well, no. There's seven of them. How is that possible?". Yet David was adamant that inclusion of all students was something New Brunswick must continue to pursue.

***Non-Random PLP Distribution.*** Though not mentioned as frequently as some of the other themes I discerned, the issue of 'teacher shopping' was addressed by four of the participants. This unofficial practice involves loading a teacher's class roster with artificially high numbers of students on PLPs or EAL students. Julia (pseudonym), another teacher at a large school, relayed her recent experience about class composition in response to a new teacher being hired. "The teacher that came in, she's a new teacher. So, they asked me to keep anybody on a plan. Which I'm fine with. She did get a few, but, you know, *she's a new teacher*, and I…that's fine". In this case. Julia was willing to take on a more academically diverse class to shield the new teacher from that experience. Michelle (pseudonym), a veteran teacher at a large school was more blunt, "If you're good at handling those heavy loads, you'll always get the lion's share. And I tell ya, that isn't right. That can't last". Teachers feel as though demonstrating competency can have a negative effect on their workload when compared to their colleagues who have not been as successful in incorporating students from a variety of backgrounds. It can become a

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yearly issue where teachers who consistently exhibit competent teaching practices for a variety of students would receive a disproportionately high number of students on educational plans. Since there is no cap on the number of students who are on a learning plan, nor a cap on the number of new Canadians, rosters for the same course can again be drastically different in their composition. Conversely, teachers who have struggled meeting the needs of a wide spectrum of students would be avoided when planning class rosters. One teacher reported that their SPR (teacher with a Special Position of Responsibility, previously known as Department Head) shared this practice with them openly, insisting it was in the best interest of the students. This leads to teachers having an unequal amount of time dedicated to preparing for each course.

**Time for Preparation**

When teachers are made aware of their class rosters or have come to learn that certain students require assistance, meeting with Methods and Resource (M&R) teachers is important in determining steps forward. Methods and Resource teachers are specialists with training in differentiating lessons and can offer valuable insight on how to support students on Personal Learning Plans (PLPs). Their educational colleagues also offer a perspective on shared students, having potentially developed techniques that have been demonstrated to be effective. Teachers are also offered professional learning time where representatives from the school district or department of education can give in-services to offer new pedagogical practices that could prove useful for classroom teachers. Teachers expressed concern on time given during the school year to each of these avenues.

***Meetings with Other Teachers.***  Teachers convene each new school year for one week

prior to the beginning of the semester.  In between semesters one and two, teachers are

given two days as 'turn around' time.  It is during those times that teachers are hopeful to

meet with the M&R specialists to help plan for students with learning plans.  The level of

support that classroom teachers reported from these specialists varied from school to

school, but additional time was universally desired.  Teachers have very little to no time

dedicated specifically for meeting with M&R, which results in the teacher seeking out

support when they were mutually available for meeting.  Lori, another teacher at a large

school, was praising the help she received from her M&R teacher, but expressed concern

about having time to collaborate.  "Oh, she's amazing!  I'll talk to her when I can, but it

would be nice to have time to talk.  You just kind of do it as you're passing in the

hallway, I guess".  Two teachers reported that their M&R teacher would be proactive in

reaching out to them to help plan for the semester, but this was irrespective of school

size.  The remaining eight explained that they had to reach out to the M&R teacher and

attempt to plan for meeting time.

Classroom teachers are unclear of the specific role and job expectations that M&R

teachers have, with some expressing frustration at their apparent lack of visibility during

these meeting opportunities.  Interestingly, two teachers from the same school reported

starkly different experiences with the M&R staff.  Michelle complained, "The M&R?

Ugh, they don't work with the kids, they don't approach teachers, some don't show up

for co-teaching sessions.  Honestly, I don't know what they do".  Markedly different

from Trevor, "The support staff is phenomenal.  Whenever I go to them, there is tonnes

of stuff I can use in my class".  Though he admitted that the communication felt very

directed by him and would not receive any advice from M&R if unprompted. This shows that the support classroom teachers receive from M&R can vary greatly, based on interpersonal interactions.

Regardless of a teacher's opinion on the degree of support offered by M&R teachers, all participants reported meeting with support staff during their prep period, at lunch, or afterschool – times teachers viewed as 'their own time'. High school teachers are afforded one period out of five per day for planning, marking, or any administrative tasks that are required on a daily basis. Teachers covet this time as they often have supervisory duties at other times of the day as at lunch or after school.

Teachers who have either previously taught a given student or would be teaching the same student within the same semester were also described as invaluable connections because of their potentially unique prospective. This is often easily attainable in small schools and nearly impossible in large schools.

***Delivery of Professional Learning.*** Teachers are given professional learning days occasionally throughout the year to enhance their teaching practices. These can be department-delivered, district-delivered, or can be done exclusively in-house. All participants in the study expressed concern on the usefulness of these days as they often felt disjointed, with little follow-up in subsequent sessions to monitor progress. Jason (pseudonym), a teacher at a small school, summarized it as, "Something comes up, and it's really big for that year and we talk about it a whole bunch. And then the next year comes and it's like, well, why aren't we working on that anymore? We developed these projects, and then we didn't talk about it". Some teachers attribute this to changing focuses at the department and district levels. This is not to say that teachers do not see

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the value in PL sessions.  Rather, they would prefer having sessions that would carry over year-by-year, especially regarding inclusive practices.  Specifically, teachers want to be engaged in inclusive pedagogies and instructional techniques that could be extended to their classes. Trevor suggested, "Maybe someone from District could show us what they're looking for.  It would be great to have exemplars from professionals who have done it before.  Something we could take back to our classrooms".

Furthering their concerns about inclusion, few participants could recall PL that was dedicated to inclusive practices.  Though they admit that most professional learning could be extended into inclusive classrooms, teachers desire sessions that focus on contending with a classroom that has a wide spectrum of students.  Jason felt as though, "most of this stuff is clearly designed for an elementary school settling.  I'd love to see stuff that is specific to science.  We used to have meetings that were subject specific at the District and Department levels.  Those were great".  With little embedded PL time dedicated towards inclusion during school hours, teachers are left to their own support network of colleagues to help develop new pedagogy.  As identified earlier, teachers have little time to collaborate with colleagues during the school day and must therefore rely on lunch hours or chance encounters after school to facilitate these sessions.  This is also true for sifting through a PL session.  Teachers are eager to work on new ideas that may be brought forward during the sessions.

***Turn-Around Time.***  New Brunswick secondary schools have a two-semester system, from September through January, and February through June.  The school year begins for teachers one week prior to the arrival of students and is typically used for district and province-based PL, with meetings at the school level interspersed throughout.  One of the

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unique issues to semester two start-ups is the very short turn around time. At most, teachers have two days to prepare for the new semester after grades have been entered and verified from the previous semester. Though teachers can prepare for the new semester well in advance, the student rosters and its composition are not finalized until the turn around days. Student rosters can be greatly affected by the success or failure of passing courses in the first semester. As a result, the composition is in a state of flux until the very last minute. During this time, M&R teachers must input students on PLPs to specific teacher's electronic database. Classroom teachers are only capable of observing the files of students that they are to have in their courses. As a result, teachers may only have access to the PLP files after M&R staff input this information. This all culminates in teachers not seeing information about their students on plans until just before the semester starts, and at times, a week or more after the semester begins. This means that teachers must spend time tracking down others in the school who have had interactions with the students they have on PLPs, an issue discussed earlier. Though teachers can learn valuable information about their students when they meet them at the beginning of the semester, there can be critical information about *how* to interact with certain students that have behavioural or social issues. This information is often found on the files that teachers have access to electronically but is completely dependant on access being granted. This can be addressed by finding the student's cumulative school file and sifting through the relevant information. However, this too is not as simple as it sounds as the student's five other teachers may be looking for this information as well. Ultimately, teachers spend a disproportionate amount of time during semester two start-ups preparing for including students with any sort of exceptionality. This is not limited to

students on PLPs, as students who are new Canadians also have unique needs that require advanced preparation.

**Execution of Daily Lessons**

This final theme addresses what happens on the day-to-day basis for teachers. Though the themes discussed earlier have an impact on the execution of lessons, there were a few categories that would vary daily that could not have been predicted earlier. The presence or absence of Educational Assistants (EAs) was mentioned as an important factor by all participants. However, the relative comfort and competence level in science that EAs demonstrated had a direct impact on their usefulness. Finally, the pace in which teachers can proceed through material is affected by the issues with student attendance identified earlier.

*Presence of Educational Assistants: Exclusion by Means of Inclusion.* A traditional practice in New Brunswick is to support a classroom teacher with an Educational Assistant (previously known as a Teaching Assistant). EAs typically do not hold teaching licenses, but rather are present to support students who require additional support academically, such as one-on-one teaching. With cuts to EA numbers in schools, EA roles have been triaged to students who require the most support, often for medical or social reasons. Michelle felt as though, "EA's aren't educational assistants, they're behavioural and medical assistants. Half the time I see them in the hallway walking continuously with a student. Because that's our plan for them: walk for the period". Though a given course may have multiple students who are at various learning levels, all of which are below grade-level, some teachers perceive EAs as caretakers to these

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students. Whether this aligns with the perception EAs have of their roles was not discussed. Teachers observe that the time EAs would have traditionally used to help students academically is now dedicated to ensuring appropriate behaviours of students. This often takes the form of clustering students on PLPs in one corner of the room for logistical purposes for the EA. Teachers do not take this practice lightly, as David expressed, "We take these students and shove them into a corner of the room. That's not inclusion, that's exclusion through 'inclusive' practices". He continued this line of thought and mirrored what many of his colleagues had expressed: the current model of inclusion can be more exclusionary than academically streamed courses. Michelle was clear in her feelings, "We warehouse them. And that's a term that I stand by. We warehouse these kids so we can check off that we have these kids in our class". I observed this practice in multiple classrooms throughout the district. With a declining number of EAs, teachers group students in general categories of 'requires additional support', regardless of the reason. This means that students who require EAs for cognitive, behavioral, or medical reasons are physically clumped together in a form of micro-exclusion within an inclusive class. This practice was nearly universal in the classrooms I observed.

In execution, this also means that if teachers want to dedicate some one-on-one time to a student on a PLP, it is often at the expense of all others in the room. Though one-on-one time will always present this issue, the large numbers of students on PLPs combined with the decreasing number of EAs results in more time dedicated away from the collective. This manifests as two possible outcomes: teachers dedicate that time to individuals or provide students with 'make work' projects. A commonly used technique

is to provide these students with a workbook filled with material that is more aligned with their current level of understanding.  Often this is merely material from younger grades that is loosely connected to the outcomes found in the curriculum document.  During my observations of different classrooms, I noticed that this practice was especially prevalent in the Science 9 and Science 10 courses where the range of abilities was at its maximum. Though, to the teacher, the instructions were made clear to the student of what they were expected to complete, the students often lost focus quickly.  At this point, it would devolve to the student doodling on their paper, attempting to use their phone, or simply placing their head down on their desks.  Teachers were quick to see this and would be forced to stop what they were doing and get the student back on track.  Conversely, when an EA was present it was far easier to keep the student engaged.  This allowed teachers to monitor progress and offer assistance when more natural breaks presented themselves.

***Comfort Level with Science.***  If EAs are available to help students, teachers noted that at times it can be challenging for EAs, depending on their comfort level with the science concepts being taught.  This would become an issue if the EA was dedicated towards a student on a behavioural plan, and thereby was learning the same academic content. Stacey explained, "The EAs really give their all to my students.  I can just tell sometimes that science…it's not their jam".  This issue would become more of a challenge if the student had a dedicated EA because of a behavioural or medical issue.  In these instances, the student is likely learning the same material as many of their classmates.  If the EA is unfamiliar or uncomfortable with the material, their ability to help the student is limited. The teacher would thereby be spending more time with the student, again reducing their time with the remaining students.  An alternative some have adopted is to meet with the

EA briefly before class to give a quick refresher on the material to raise the EA's

confidence level, which is met with the same challenge as meeting with any other

professional in the school.

***Role of the EA with Discipline.*** An issue that was hesitantly discussed by some teachers

is the exact role that EAs have in the classroom, not because of academics, but rather

because of behavioral issues. Teachers perceive the role of the EA as becoming more

fluid, which can lead to complications when discipline issues arise. This could be in the

form of the handling of the student the EA is responsible for, or for other students in the

classroom. Three of the participants commented directly about situations where the exact

role of what EAs were expected to do in specific situations was not clearly defined, and

only became evident when an incident occurred.

Trevor relayed a situation where a student who had become unruly for a variety of

reasons was asked to leave the room with the EA to de-escalate the situation. When the

student refused to go, Trevor was asked by the EA to tell the student they had to leave.

When the student refused to go and became loud and verbally abusive, the EA attempted

to remove the student by force, placing Trevor in a situation where he wanted to help the

EA, but was concerned about repercussions of handling a student. A solution was

determined by the administration staff and resource teachers that if this student had a

similar outburst, the teacher was to remove the other students of the class and relocate to

another empty classroom. He lamented how this meant a total disruption of all the other

students due to an inability to contend with a student who was having an outburst. This

notion that the needs of individual students is impacting the remaining students in the

class was shared by many other participants.

***Student Mental Health Concerns.*** A feature that was independent of school size, course grade, or classroom composition was the perception of increased issues regarding student mental health. Though the approach to dealing with these concerns did have variance between schools, there was a consistent concern amongst many of the participants on the impact this would have on their ability to teach their courses. The most cited concern was the effect mental health had on attendance. Students routinely missed time either once to twice a week or would miss larger swaths of time that could drag into weeks. Teachers would be expected by administration or by guidance councillors to prepare material that students could complete at home or would attempt when they returned to school. This could be a complicated request when the material that students would miss was the foundation for material being covered upon their return. Teachers would spend time during lunch hours or after school to get these students caught up, effectively re-teaching the material that was missed.

A further impact this would have would be completing tasks such as labs that were designed to supplement the material that was being taught in the more traditional lecture format. If this involved using perishable materials, such as live specimens, teachers would either have to prepare another activity that would model the experience or adjust how the students would demonstrate their knowledge of a particular concept.

Attendance issues were not limited to mental health/anxiety complications. Teachers of lower grade levels, covering courses like Science 9 or Science 10, identified concerns with the disparity between attendance expectations at the middle school level and at the high school level. Social promotion of students, that is to move a student on to subsequent grades not based on academic achievement, but rather the age of the student,

was a practice identified by high school teachers that does not align with the expectations at the high school level. Michelle stated, "Nobody fails in Middle School, and because of this we expect less and less of our students. They could miss 40 days and still pass a course". For context, 40 days would be approximately one-half of a semester. This was taken a step further by Stacey who described one of her students "who misses so much time, has to be modified because he can't cover every outcome. Only because of his attendance". Stacey went on to outline how she has to prepare modified learning plans for this student, not because of his ability to cover concepts academically, but rather from the sheer amount of time he missed. While present, this student demonstrated competencies that would align with his typical classmates, meaning he could cover the material prescribed by the curriculum. However, his learning gaps from time missed were so great, he could only be successful in the course if he had a modified learning plan.

Concerns regarding student mental health also had the effect of extending teachers role beyond delivering curriculum. Many teachers identified an unspoken new role as a councillor to their students yet felt unqualified to offer such a service.

In the next section, I will look what this execution means for secondary science education in New Brunswick.

# Chapter 6: What Does This All Mean?

This research was carried out to investigate how New Brunswick teachers implement inclusion in their secondary science courses, something that affects all learners in all schools. The execution of this has been determined through the major themes addressed earlier, but what remains to be discussed are the implications for students and teachers alike. Through past conversations I have had with parents of students currently in the New Brunswick school system, I have learned and empathised about what impact this will have on our children. Understanding how inclusion is realized is one thing, what it means for students and teachers is another. In this final section, I explore the meaning this data has for today's secondary science courses in New Brunswick. I have condensed this discussion to two major categories: the implications for teachers and the implications for students. Though both categories are very much related, the meaning for each merits its own section.

## Teachers

### *Levels of stress on the rise*

An interaction with Trevor summarized how many teachers were feeling. At the closure of the initial interview Trevor revealed what this means for him, "I mean, this can be really stressful. I'm only a few years in and I don't like to think about what this means for my future. I mean, this is my career and I'm already wondering why I became a teacher". At this point, Trevor wiped away a tear and apologized for getting upset. When he was assured that this was fine, he finished with, "It's stuff like this that helps. Just having someone who has been in the field for a while to bounce your feelings off of

without any fear of repercussion". Much can be gleaned from both exchanges. Most pointedly, Trevor is showing signs of stress that would lead someone to stepping away from their teaching responsibilities through stress leave. His fear of experiencing some form of repercussion was informative as well. Being a one-year D contract teacher, Trevor lacks the job security of more veteran colleagues. Expressing concerns of stress level to administration could negatively impact his ability to obtain a permanent B contract. Trevor allowed himself to picture his career trajectory as a science teacher in New Brunswick and was met with feelings of dread and regret. Though no other participants reached this level of emotion during their interview, Trevor's view was not unique. At the other end of her career spectrum, Michelle was more succinct, "All I can say is, thank God I'm retiring in a few years". She too commented on a growing number of colleagues who were taking stress leaves. A similar sentiment was expressed to Lori by a veteran teacher's course load she was taking over, "I think the teacher I was replacing was pretty much, 'Well, good luck!'. You could tell he was glad to be done". Lori is at the mid-point of her career and found the interaction troubling. She explained that she was excited to be given the opportunity to teach a grade 11 level 2 course as this would traditionally imply a clientele that had a narrower scope of student diversity, lessening the number of unique plans she would have to prepare. To her chagrin, many of the student roster issues she found in Science 9 and Science 10 were present in this advanced science course. Workload and classroom stress have been negatively linked with self-efficacy and job satisfaction among teachers (Klassen & Chiu, 2010).

The majority of participants in this research identified stress as an impact of inclusion on teachers. Some laboured the point more than others, but the message they

were trying to convey was clear – a broad range of learners in science courses brought about by inclusion is increasing the workload and thereby the levels of stress. This is a major facet that was followed up on during the second interviews that served as member checks. When pressed on this question, all participants agreed that teacher stress would be an issue to contend with in the future. The level of impact varied in the participant pool however. The contrast between interactions with Trevor and Jason aptly demonstrates this. Whereas Trevor was brought to tears when considering his future, Jason offered, "I'm not going to worry about it. If I have to deal with a greater range of students, I'm going to do the best I can. It won't keep me up at night". The divergence of these responses could be attributed to the availability of resources that teachers draw from when confronted with a greater workload. Indeed, Troesch and Bauer (2017) suggested that second-career teachers reported lower levels of stress than first-career due to higher levels of self-efficacy that was built upon a greater resource pool to draw from. Though this research did not investigate whether each participant was in their first career as a teacher, the notion of resource availability is useful to draw from.

**Recommendation: Master teachers as mentors.** The reported level of stress participants identified suggested teachers desire a greater pool of resources to draw from to address an inclusive classroom. Veteran teachers like Jason have years of experience to draw from, helping mitigate stress levels. Master teachers who have demonstrated competence are a valuable in-house resource that can be drawn from. Veteran teachers in this research recalled a now-defunct induction program that paired veteran teachers with new teachers in their first two years of service. The veteran teacher acted as a mentor that the new teacher could confide in, without any intervention from administration.

Early teacher induction programs have had a history of success in retaining early teachers (Ingersoll, 2012).  Anderson, *et al* (2014) outlined the importance of mentors in the success of first year secondary school teachers.  Participants identified effective mentoring as critical in their success as an early teacher.  Surrette (2020) reported the success in a mentoring program that assisted early career science and mathematics teachers.  However, this research suggested that workload was a concern of participants involved, and the adding of a mentoring role to the duties of a veteran teacher could be counter-productive.  Additionally, this model would not assist teachers who are beyond their first two years in their career and yet would still benefit from this interaction.

A lead teacher framework for an alternative at the school district level currently exists, albeit in a limited fashion.  Leads are experienced teachers who have demonstrated competence in their own classrooms and have been hired by the district solely as a mentor.  Leads travel from school to school, acting as a co-planner/co-teacher for teachers requesting those services.  At the time of this research, there was one lead position split between 37 middle and secondary schools in the entirety of Anglophone School District-West.  Having completed this role personally during the 2019-2020 school year, I can attest to its value.  The challenge is simply logistics – one person to cover 37 schools is not tenable.  Having a greater number of lead positions would allow for a greater number of teachers to be assisted over the school year.

### *Teachers Require Greater Professional Learning*

As with many professions, teachers are required to participate in professional learning opportunities throughout the school year. A common sentiment among participants was that, for secondary science teachers, PL sessions rarely appeared to be geared towards their grade level or subject. The realities of a primary school teacher would be drastically different than those of secondary science teacher. Accordingly, PL sessions should reflect this reality. By consulting with colleagues at various school levels, participants in this research expressed frustration in discovering that there is a uniformity to the district or department led sessions. As Kyle described, "You can just tell, these sessions were designed for elementary teachers. How is this useful in my high school science class?". Professional learning is most effective when the sessions are designed with a specific clientele in mind (Fallik, 2008; Putman and Borko, 2000). Stacey requested, "Stop *telling* me to differentiate my lessons, or think outside the box. *Show* me how to do it. Give me a lesson that's been designed for several different learners, and I can take that to my own class". There was a common sentiment among participants that if it was as easy a simply saying 'differentiate your lessons', it would be done already. Teachers are looking to their district level and DEECD leaders to provide that level of guidance, at the very least being pointed in the direction of where this can be found. There is a concerning level of distrust of the senior administration found at both the district and department levels as many participants felt that these representatives have not been classroom teachers for an extended period of time.

**Recommendation: More personalized PL.** If professional learning is to be effective, there needs to be some level of autonomy for the teachers (McElearney *et al*.,

2018). The profession of pharmacy can be used as an example.  In New Brunswick, pharmacists must complete a set number of continuing education (CE) credits to retain their license every year.  CE credits can be attained through attending professional conferences, taking online courses, or completing license upgrades as a few examples. Each pharmacist is given the professional discretion to choose what CE is most useful to them.  A similar model could be created for all teachers in New Brunswick.  David attended a physics teacher night presented by a university while he was teaching in another province in Canada.  During this session, local physicists offered an evening of learning by presenting some of the current research in physics that would apply to secondary school sciences.  He remembered it fondly, "Now that, that was more useful than any PL I've attended in a while.  I learned more in those three hours than I have during an entire Subject Council day".  Subject Council is a day in the spring of each year that all teachers attend, organized by the New Brunswick Teachers Association that provides multiple PL opportunities in one location.  Four participants in this research identified that day specifically as PL that lacks a secondary school science lens.  The annual National Science Teaching Association conference in the United States would be an example of an alternative PL that could be far more suited to secondary science teachers.  By being given greater control over their own learning, teachers can be empowered to enhance their craft through means that are most effective to them.  The greatest irony is in having standardized PL for teachers about the importance of reaching students of a variety of backgrounds.

### PL building on itself over the year, or years

In a similar vein mentioned previously, effective professional learning is essential when implementing inclusion.  A concern that many participants brought up was a lack of consistency in delivering PL, with a particular focus on the year-to-year or even semester-to-semester timeframe.  Many participants recalled situations where they received effective PL delivered over a single day but lacked any formal follow-up.  Without long term consistency in the message being delivered by senior administration, teachers were more likely to forget or more pointedly, discard, what they had learned on that PL day.  Long term PL, with opportunities to reflect on what has been learned previously, increases the likelihood that teachers will effectively employ these new ideas in their courses (Timperley, 2011).

This need not be a formal session delivered by a District or Department individual.  Rather, being given the time to unpack and discuss ideas with fellow colleagues would suffice in many situations. Day and Gu (2007) outlined the importance of having support from both principals and fellow teachers in maintaining a learning climate.  Indeed, Muijs *et al*. (2014) stressed the importance of teacher feedback on professional learning to facilitate effective future sessions.  Teachers want follow-up for sessions that may be useful, manifested as check-ins' to see if what they are doing is working.

### Teachers need collaborative time

Within each secondary school is a wealth of experience from other classroom teachers, methods and resource teachers, and educational assistants.  Valuable insight into better practices need not come from outside sources (Watson, 2014).  Teachers who have

dealt with the same student population, even in different subject areas, can aid in implementing inclusion in science courses. Participants in this research consistently identified time for collaboration as an attainable and effective method in preparing for an inclusive classroom. With conflicting schedules and the challenge of day-to-day requirements of being a classroom teacher, finding the time to collaborate is unattainable in many cases. Teachers yearn for dedicated time set aside exclusively for these meetings, as the limited interactions they can find often yields useful feedback on best practices.

**Recommendation: Dedicated weekly collaborative time.** Secondary schools in New Brunswick divide the day into five periods of instruction, with breaks scattered in between. How those periods are allotted, and when the day begins and ends is at the discretion of the school. Factors such as busing and presence of middle or elementary students in the same school influence the amount of flexibility each school has, but is present nonetheless. One secondary school in ASD-W attempted to provide collaborative time daily by delaying the beginning of the first period of the day, providing 30 minutes to be carried out as each teacher saw fit. This could manifest as team meetings between teachers of the same subject, sessions between teachers of different subject areas, or opportunities to meet with methods and resource teachers. Having the freedom to decide who to meet and for what purpose lessens the stress of attempting to meet with very different schedules.

**Students**

*Modified students are receiving less support.*

As identified earlier, science teachers in New Brunswick viewed diversity through two different lenses – diversity of cultural background and diversity of academic ability. The latter is a facet that teachers in all schools had observed and dealt with. David expression of "exclusion through inclusive practices" is central in this notion. Emma, also from a small school, further explained this concern by admitting, "I've been very unprofessional in the past few years. I've told more than one parent that their child, who is on an IEP, is falling through the cracks. I'm too busy putting out fires to give their child any meaningful interaction". Emma explained that students who have academic challenges but do not display any behavioural or health issues get little of her attention as there are more pressing matters in the classroom. Universal cuts to support staff like educational assistants increases the demand on classroom teachers. EAs that are present in classes typically have the sole purpose of one-on-one interaction with students of high behavioural or health needs.

*Students requiring enrichment.* An unintended consequence of the more inclusive model of education is a lack of focus on students requiring enrichment. No participants in this research identified students who were deemed to be above grade level when identifying their definition of inclusion and diversity. As discussed earlier, the definition of those terms often was dependant on the size of the school a teacher was employed in, in addition to previous life experience. Yet many participants expressed concern that students who would typically be identified as academically gifted are being forgotten, regardless of the school size. The phrase 'watering down of the curriculum' was brought

up in multiple interviews and journal entries with some veteran teachers drawing from specific examples of material covered in previous years being removed due to concerns of pushing their classes too quickly. A few went as far as to discuss conversations they had with university professors who confided in them that students are not as academically prepared as they have been historically. In this sense, teachers are contending that an even wider range of students are experiencing negative effects from a more inclusive classroom. Be it the lack of material that is being covered in a given semester, hands-on laboratories being removed due to safety concerns, or lack of time to design enrichment activities, teachers feel as though students are not receiving as rigorous a science experience as in years past.

**Recommendation: Dedicated pull out time.** Most participants fell short of envisioning a scenario where streamed courses were present in New Brunswick. Though it should be noted that this concept is still practiced by the existence of level 1, Advanced Placement, International Baccalaureate, and level 2, university preparation courses. None of the participants in this research advocated for the removal of said courses. However, the concept of targeted grouping was suggested as an alternative, achieved through team teaching. There are a few avenues by which this could be executed. If methods and resource teachers were pulled back into the classroom, the expertise they provide could be directly applied to classroom settings. This would require a re-envisioning of the role of M&R teachers, possibly increasing their numbers in schools.

In a second avenue, teachers of the same subject area could share a larger roster, effectively combining two different classes. In this scenario, two unique lesson plans

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could be carried out simultaneously, each meeting unique criteria. Logistically this could

be challenging as it would require a classroom that is physically far larger than is typical.

The final avenue draws on a recommendation made earlier. The presence of

science leads in a school would allow for co-planning and co-teaching within the

standard class size. Lead teachers provide the expertise of experience that brought them

to the position to begin with, but also have the added benefit of drawing on practices

executed in other schools. This sort of inter-school communication is rarely found

otherwise.

### *English and science challenge for new Canadians*

The increasing number of new Canadians in all sizes of schools presents unique

challenges, especially in schools where new Canadians typically were not present in the

past. Students whose first language is not English are at an immediate disadvantage

when taking science courses. Science presents its own lexicon that English speaking

students can struggle with, let alone those who are learning basic English vocabulary.

The question with EAL students becomes this: is their struggle due to a lack of

foundational language, or is there a more complex challenge? Would this student have

the same academic issues in their first language? The concern is that these students

become mislabeled and the truth is not revealed until much later in their academic career.

The possibility of hidden, untapped potential becomes far more possible. According to

the participants in this research, a common practice is to place these students in level 0

courses where the curriculum can be modified. Students are then given a less

academically demanding experience, more in line with English first language students

who are on personalized learning plans. What sets secondary schools apart is the limited

time students have remaining in the school system.  A new Canadian has at most four years to as little as one when they arrive to Canada at secondary school age.

**Recommendation: Increase the number of EAL specialists.**  It is not feasible to have a member on staff who is fluent in the language of every EAL student.  However, having an individual with specialized training would be more apt in discerning where the actual struggle is for these students.  Like the collaboration recommendation mentioned earlier, these teachers could be called upon by classroom teachers to help plan more effective and authentic experiences for EAL students.  Having dedicated EAL courses would give these specialist teachers the time to determine the current level of understanding these students have.  Adger *et al.* (2002) argued that teachers require an understanding of language and language learning to identify appropriate means of teaching and evaluation.  Adding to this, Murtagh and Francis (2011) contend that a two-year window of language acquisition is insufficient for many newcomers to obtain a level of academic English required to gain full access to the curriculum.  Given that some new Canadians are entering the school system in the last years of secondary school, this serves to highlight the importance of effective intervention from EAL specialists.  In practice, some small schools in New Brunswick have no dedicated EAL teacher on staff making them reliant on support from District leads.  With recent cuts to the number of positions at this level, this would be a significant challenge.  However, with clear desire from classroom teachers for these positions, this should still be considered.

**Limitations of the Study**

This research was conducted over ten schools in one Anglophone school district in New Brunswick. Given that there are four Anglophone and three Francophone districts, it should be treated as a sample, but not a picture in its entirety. Schools chosen were meant to represent both rural and urban backgrounds, including size of population. With certain autonomy given to each school district, there is likely to be some variations in which the guiding policy documents from DEECD are interpreted. Having additional research carried out in each district would be helpful in determining the validity of the findings. Teachers participating in this research provide a lens into how inclusion is operationalized, but is by no means a mirror of how every teacher implements inclusion.

**Future Research Considerations**

A point of interest that would warrant further discussion and investigation is the impact of inclusion on students in New Brunswick science courses. Many participants lamented the negative impact on a variety of students, often harkening back to the days of streaming. Determining the validity of this assertion would be a worthy endeavour as it looks to answer whether students are better off in the current classroom environment. One would hope that every decision made about schools and classroom compositions is meant to be for the betterment of students and, on the whole, society in general. Though it would be challenging to determine the metrics by which a schooling system can be measured, the experience of every student entering the New Brunswick school system hangs in the balance.

This research was designed to answer the question of how science teachers implement inclusion. The findings of the three major impacts on operationalization – classroom composition, planning time, and daily execution of plans reflects the reality for the ten participants and likely for many others in New Brunswick. My hope is that this could be the impetus for a larger conversation of inclusion in general.

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# Appendix A: Interview Questions

Sample questions to be given at the time of the interview.

1.  What courses do you teach? Describe the typical student composition in your science courses.

2.  Policy 322 – Inclusive Education was introduced in September 2013, describing the basic architecture of how inclusion should be implemented in New Brunswick schools.  How do feel this Policy applies to the courses you teach?

3.  Describe what you define as inclusion in a classroom.  Does this differ from diversity?  How so?

4.  Over the past four years (since Policy 322 was implemented), how much time in professional learning sessions has been dedicated to inclusion?  What has that looked like?

5.  What has been the role of support staff in your school regarding the variety of students in your courses?  This can include resource teachers, educational assistants, and guidance counselors.

6.  What has been the role of administration in your school regarding the variety of students in your courses?  This can include SPRs, Vice Principals, or the Principal.

7.  How do you and your fellow classroom teachers support each other in preparing for the variety of students in your courses?

8.  At the beginning of the semester, how do you prepare for the individual student needs in that particular course?

9. How would you describe your comfort level in having a wide range of learners in your classroom?

10. If you could wave a magic wand to offer yourself some aid with regards to implementing inclusion in your classes, what would you wish for?

# Curriculum Vitae

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