The Power of Building a Growth Mindset Classroom

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Abstract

The aim of this research was to investigate the role of growth mindset in elementary classrooms and identify strategies educators are using to promote this behavior. The primary research question that guided this study was: How is a sample of educators fostering a growth mindset in their students and what outcomes do they observe from their efforts? Data was collected through two semi-structured interviews with one principal and one teacher. Through the data collection process, four main themes were identified. First, the manner in which educators define growth mindset influences how they conceptualize intelligence in students. Further, these personal definitions of intelligence impact teaching and assessment strategies through the consideration of various learning styles. As such, teachers can assess students using a growth mindset through descriptive feedback and by valuing student effort. Finally, embracing challenges and mistakes was regarded as imperative in the individual growth and progression of students. The implications suggest that in order for growth mindset to become prevalent in more classrooms, teachers must adopt this mentality and embrace how it can influence their teaching. It is recommended that more professional development and resources become available so that teachers are able to imbed growth mindset into their classrooms.

Key Words: Growth Mindset, Intelligence, Assessment, Resiliency, Well-being
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Chapter 1: Introduction

1.0 Research Context and Problem

The education system in Canada, and North America in general, has a tendency to be results-oriented as opposed to focusing on student progression and learning. Every student receives a report card that is intended to be an accurate reflection of their knowledge in a particular subject area. A teacher’s evaluation and assessment of a student can have long-lasting social, emotional, and academic implications (Tierney, Simon, & Charland, 2011). In many areas that use a standards-based system, such as the education system in Ontario, a teacher’s interpretation of student performance follows a strict set of guidelines that may not accurately reflect their true achievement (Tierney, Simon & Charland, 2011). As such, teachers commonly assess students based on their demonstrated skills and abilities, undermining the effort and progress that are not captured by the set standards of evaluation. This results-based framework can give students the impression that they are either smart, or they are not, based on the grades that they receive. In this light, the emphasis on results and standards can indirectly cause students to think that they are born with a certain level of intelligence and there is not much that can be done to change it (Boaler, 2013).

People who believe that their intelligence is stable and not susceptible to improvement possess what is known as a fixed mindset (Dweck, 2010). A fixed mindset can develop in a number of different ways, including susceptibility to stereotype threat in which societal beliefs about the intelligence of a particular group of people can impede an individual’s confidence, directly impacting their performance on a given task (Good, Aronson, & Inzlicht, 2003). Other influences that induce a fixed mindset include a feeling of learned helplessness as a result of continuous underperformance or failure, or becoming labelled by the opinions and perception of
others (Yates, 2009). In contrast, Dweck (2010) identifies a growth mindset to be the belief that intelligence is malleable and can improve with practice. People who have a growth mindset are open to challenges, value mistakes as learning opportunities, and emphasize effort over ability (Dweck, 2010). The benefits that an individual can expect with a growth mindset extend well beyond the classroom and can allow them to gain confidence in their ability to overcome obstacles (Dweck, 2008). An education system truly oriented towards learning and personal growth requires students to be able to make mistakes, take risks, and partake in challenges that allow them to correct deficiencies and expand their cognitive abilities (Dweck, 2007). The application of neuroscience research in the classroom can highlight the notion that the brain is capable of making new connections that facilitate deep learning (Garlick, 2003).

There is a gap between research on intelligence and the practical implementation of this knowledge in the classroom. As such, some teachers may not be fully aware of the benefits that can be garnered from inducing a growth mindset. While the application of a growth mindset in the classroom is at its early stages, the benefits of introducing this mentality to students can result in greater confidence, increased self-esteem, and ultimately greater levels of achievement (Robins & Pals, 2002; Grant & Dweck, 2003). With less emphasis on results and more value placed in the process of learning and progress, teachers can obtain a better reflection of a student’s achievement and potential. The challenge moving forward with this thinking is that there is currently not a practical form of assessment that considers all factors that reflect an individual’s true ability (Tierney, Simon, & Charland, 2011). There is a need for increased professional judgment on individual student performance and emphasis on progression as opposed to production.
1.1 Purpose of the Study

The purpose of my research was to learn how a small sample of educators foster a growth mindset in their students, and to learn what outcomes they have observed from their practice. With the implementation of a growth mindset becoming increasingly prevalent in Ontario classrooms (System, Implementation and Monitoring K-12, 2015), I intend to learn about the range of strategies and approaches teachers use. Whether it be fostering and assessing learning through critical challenges, risk taking, making mistakes, or monitoring progress, the results they notice may have great implications for future research and practice. The goal was to understand how this sample of teachers and principals define individual success and build an environment tailored around growth and progress. With this study, I hope to further establish the validity of a growth mindset for students of all learning levels so that this mentality can become a prominent staple in every classroom.

1.2 Research Questions

The primary research question that was pertinent to this study was: How is a sample of educators fostering a growth mindset in their students and what outcomes do they observe from their efforts? Supplementary to this investigation, additional questions that directed my research were as follows:

- What does “growth mindset” mean to these teachers?
- What are these educators’ perspectives on how their personal definitions of intelligence shape the way they teach and assess student performance?
- How do these educators assess student performance through a growth mindset orientation?
• How do these educators conceptualize the role of challenges and learning from mistakes and failure in fostering a growth mindset?

1.3 Background of the Researcher

As a psychology graduate and former student in the Ontario school system, I have come to the realization that many of the methods in which students are taught and assessed may not be best for overall learning and development. In my opinion, the school system is a results-oriented institution that rewards students for success, and penalizes students for failure. What the school system does not do particularly well is assess students on their individual progression, effort, and ability to strive to do better in light of failure. The emphasis on results can make students believe that if they fail, they themselves are failures. Students may be punished with bad grades, discouraged to learn, and fall under the impression that this is the way they are and that they cannot do anything about it. This, in my opinion, is not how teachers can get the very best effort out of their students. Schools should not be penalizing students to the extent that they do if they do not perform at a level that matches their cohorts. Every individual learns differently and at their own pace, and this should be reflected in assessment. With an increased emphasis on the progression and growth of each student as an individual, I believe the overall production and achievement levels will be greater.

As a student, I can say that I was lucky to possess a fairly strong memory and ability to perform well on tests and other academic tasks that tested my knowledge in certain subjects. I know that there are other ways to assess understanding such as application, communication, and thinking, but I always relied on my memory to succeed. Upon completion of a test or assignment, I would often forget the material that I learned because I did not possess a deep rooted interest in the subject material. That is, my learning goals were directed towards obtaining
the best possible grade on a particular task. Although I always seemed to do well on tests and assignments, I often felt that I did not gain anything from this type of learning. I can firmly say that I possessed a fixed mindset.

I was always told by my parents that I am smart and that I can do anything I put my mind to. While it was gratifying to hear this, I can say that it also hindered my ability to learn and grow. I was under the impression that I was naturally smart and did not need to learn new information in school to become more intelligent. As school became more difficult, I began to realize that I could not depend on my ‘natural’ ability to succeed anymore. I knew I had to change. I knew I had to put in more effort and start to develop a passion for learning. In hindsight, I began to develop a growth mindset.

If this was the case for me, I’m sure there are many other students who possess a fixed mindset. Regardless of an individual’s intelligence level, a fixed mindset can be detrimental for both struggling and excelling students as course work only becomes more difficult. My passion for the idea of growth and progress to facilitate learning is something I want to practice and carry throughout my life. My goal is to create a positive environment where mistakes are celebrated, challenges are welcomed, and deep learning is something students strive toward.

1.4 Preview of the Whole

To respond to the research questions, I conducted a qualitative research study using purposeful sampling to interview three educators about the methods they use to cultivate a growth mindset in their classrooms, and learn what outcomes they observe from their practice. In Chapter 2, I review the literature in the area of the growth mindset and its application, as well as a comprehensive overview of intelligence research. In Chapter 3, I describe my research methods and elaborate on the research design of my MTRP. In Chapter 4, I report my research
findings and discuss their significance in light of the existing research literature. Lastly, in Chapter 5, I identify the implications of the research findings for my own teacher identity and practice, and for the educational research community more broadly. I also articulate a series of questions raised by the research findings, and point to areas of future research.
Chapter 2: Literature Review

2.0 Introduction to the Chapter

In this chapter, I review the research surrounding growth and fixed mindsets, exploring the outcomes associated with each mentality and how they can contribute to individual success. I examine the current knowledge and perspectives of intelligence, comparing different schools of thought, and consider how the biological underpinnings of the brain can alter the way intelligence is perceived. Next, I discuss some of the barriers that disable students from reaching their full potential, and how educators are able to properly identify student underperformance resulting from a fixed mindset. I then begin to explore the ways in which educators can promote a growth mindset in the classroom and the expected outcomes from each practice. Specifically, I consider several pedagogical strategies including the teaching of brain science research, the celebration of mistakes and challenges, and the proper use of praise.

2.1 Fixed Versus Growth Mindsets

The term ‘growth mindset’ is a relatively new phenomenon that is starting to become more widespread in the education system across North America. Stanford University professor and founder of the concept, Carol Dweck (2010), describes a growth mindset to be the belief that intelligence is a malleable characteristic that can become increasingly stronger with practice. Those with a growth mindset believe that success is an effort driven process and learn from challenging tasks and through making mistakes (Dweck, 2010). In contrast, a fixed mindset is the belief that intelligence is a static and fixed characteristic that people are born with and cannot change (Dweck, 2010). People with a fixed mindset are less likely to place an emphasis on effort and are more likely to give up on themselves when a task is too difficult (Boaler, 2013).
2.1.1 Academic performance

It has been argued that those with a growth mindset focus on the process of learning as opposed to final results, which may be a beneficial quality to have in the classroom (Blackwell, Trzesniewski, & Dweck, 2007; Grant & Dweck 2003). In a longitudinal study by Blackwell, Trzesniewski, and Dweck (2007), the mindsets of grade seven students with similar intelligence levels were measured in relation to performance in mathematics over a two-year span. The researchers found that students who displayed a fixed mindset, believing that their intelligence was unchangeable, actually displayed a downward trend in mathematic scores two years later. On the other hand, those who were categorized as having a growth mindset, believing that their intelligence can be improved, experienced a significant increase in their math scores over the same period of time (Blackwell, Trzesniewski, & Dweck, 2007). The significant difference in mathematic ability between the two groups is a result of some important characteristics that distinguish each type of mindset. First, the group who possessed a growth mindset placed much more value in learning goals rather than final results (Blackwell, Trzesniewski, & Dweck, 2007). When studying, these individuals did not study for the mere purpose of obtaining an optimal grade, but chose to study because they were intrinsically motivated to learn and expand their knowledge in a particular area. Secondly, the students with a growth mindset were notably more effort-driven than the group with a fixed mindset (Blackwell, Trzesniewski, & Dweck, 2007). These students placed much more value in individual effort as opposed to natural ability, and as a result spent more time building from mistakes and correcting any errors in their work. Those with a fixed mindset placed a significantly less amount of emphasis on effort, and as a result did not respond well to challenges because they did not think they had the ability to succeed (Blackwell, Trzesniewski, & Dweck, 2007).
It is fascinating to examine how two groups of students, with very similar grades at one point in time, can experience substantially different trajectories as a result of their mindsets and beliefs about intelligence. While the results from this study show how a student can benefit academically from a growth mindset, it does not necessarily imply that one who possesses this mentality should automatically expect success in every facet of life. Rather, the adoption of a growth mindset can influence behavioural responses and strategies to problem solving, and alter how one approaches and perceives challenges. It is these small changes in an individual’s cognitive framework that generates the ability to make the proper decisions that lead to successful outcomes. The following subsections will discuss some of the long-term implications associated with adopting a mindset oriented towards personal growth and progress.

**2.1.2 Increased learning opportunities**

It is clear that having a growth mindset can lead to favourable academic outcomes as a result of implicit learning motivation, sustained effort, and positive responses to challenges (Blackwell, Trzesniewski, & Dweck, 2007; Grant & Dweck, 2003). Over a long period of time, the characteristics of a growth mindset can remain with an individual throughout their life and ultimately benefit them in various ways. First, a mentality oriented towards growth may lead to a greater amount of learning opportunities due to how one approaches and perceives challenges (Dweck, 2010). In one study of achievement goals, Grant and Dweck (2003) showed that individuals whose achievement goals were related to proving their ability or performance on a test (i.e., a fixed mindset) predicted higher levels of avoidance of challenges, while those whose goals related to deep learning (i.e., a growth mindset) were more likely to approach complex problems. In addition, those who were more likely to seek difficult tasks subsequently performed better on these tasks than those who displayed a fear of failure (Grant & Dweck, 2003). The
willingness to approach challenges is a hallmark characteristic of a growth mindset, and can ultimately increase chances for learning and success through risk taking. An individual with a growth mindset may learn something new about themselves and be surprised with how well they respond to adversity. On the other hand, having a fixed mindset can consequently lead an individual to undermine their ability in the face of challenge, and therefore sacrifice a potential learning opportunity (Dweck, 2010).

2.1.3 Resiliency

Another outcome that may result from an individual adopting a growth mindset is a positive change in responses to failure and setbacks (Dweck, 2010). In a world where an experience of failure is likely to occur at some point in time, how one perceives this adversity can ultimately influence their subsequent actions. There is an abundance of research exploring why some individuals are more resilient than others upon failure, and some suggest that explanatory style may contribute to response to setbacks (Martin-Krumm, Sarrazin, Peterson, & Famose, 2003). For instance, Martin-Krumm and colleagues (2003) found that individuals who consistently attribute negative events to stable and global characteristics, are likely to experience lower expectations of success, increased anxiety, and ultimately lower levels of resiliency after a feeling of defeat. People with this pessimistic explanatory style believe that their underachievement is caused by their ability that they cannot change, similar to that of a fixed mindset. On the other hand, those with an optimistic explanatory style, believing their performance not a stable quality and can be improved, mirrors that of a growth mindset. These individuals are much more likely to respond positively to failure and setbacks, causing them to identify and work to correct any errors that may have occurred (Martin-Krumm, et al., 2003).
2.1.4 Self-esteem

In addition to increases in learning opportunities and resiliency, a growth mindset can also foster positive self-esteem — a characteristic related to one’s feelings about themselves and their self-worth (Robins & Pals, 2002). Robins and Pals (2002) show that individuals who believe that intellectual ability is a fixed characteristic are likely to say negative comments about themselves in light of failure. These individuals blame themselves and feel hopeless if they are unsuccessful in a task after the initial attempt (Robins & Pals, 2002). The main problem with this self-theory of intelligence is that people are likely to experience fluctuations in self-esteem as a result of inconsistency in performance. On the contrary, people who believe that mental ability is something that can be improved are less likely to experience deficits in self-esteem after an unsuccessful performance (Robins & Pals, 2002). Despite poor performance, these individuals are more likely to have an optimistic view of failure, build from their mistakes, and reflect on what they learn. (Robins & Pals, 2002). Those with a growth mindset are less likely to experience fluctuations in self-esteem due to the consistency in which they respond to feedback (Robins & Pals, 2002). The ability to keep a consistently optimistic and positive attitude on oneself in spite of failure is an advantageous quality that can benefit an individual in many areas of life.

Despite the abundance of research suggesting that a mindset oriented towards growth and progress can have a substantial influence on one’s overall achievement and wellbeing, there is a large number of people that still believe intelligence is a stable characteristic that dictates whether we can be successful or not. One sample suggested that over 60% of students display at
least some characteristics of a fixed mindset (Dweck, 2008). This belief of intelligence may cause students to undermine their ability, thus impeding them from reaching their full potential. It is critically important that teachers and students fully understand what intelligence means and how knowledge of brain science research can ultimately be advantageous for personal achievement.

2.2 Understanding Intelligence

The field of intelligence has experienced a range conflicting theories and schools of thought over the past 30 years, possibly due to the evolution of research and technology (Garlick, 2003). The concept of intelligence has no universal definition as it is culturally derived, but it will broadly be described as one’s higher cognitive abilities that contribute to tasks such as problem solving, reasoning, and creativity (Sternberg, 1999). There is research that attempts to uncover individual differences in intelligence, but it is a challenge to definitively ascertain the factors associated with variance in cognitive abilities. It is important to properly integrate contemporary neuroscience research and traditional intelligence research in order to create a greater overall picture of how intellectual ability is perceived (Garlick, 2003). Although it is common to wonder what makes one individual smarter than another, the answer may not be as clear cut as some may think. This section reviews competing schools of thought, comparing general and fluid intelligence, and will discuss how neuroscience may revolutionize how intelligence is conceptualized for years to come.

2.2.1 General factor of intelligence

It is a natural human curiosity to wonder what intelligence really is and how it can be measured. One of the greatest questions in this field pertains to whether intelligence is something people are born with, or if it is something that can be developed. One of the first theories that
attempted to reveal the mystery of intelligence was developed by Charles Spearman who argued that intelligence is a heritable characteristic that is stable over time (Jensen, 1998). Specifically, Spearman argued that if an individual succeeds in one particular task on an intelligence test, they are likely to excel in all other areas as well (Garlick, 2003). This concept is known as the g-factor, or general intelligence, and represents the positive correlation that exists across all areas of cognitive ability. Moreover, it has been argued that this general factor of intelligence is a heritable trait, indicating that some people are simply born smart, and others are not. Therefore, the theory of general intelligence is congruent with the beliefs of an individual with a fixed mindset. To illustrate the stability of intelligence, Jensen (1988) maintains that IQ (intelligence quotient) is a genetic trait that can explain certain societal disparities in intelligence, including the black-white gap in IQ scores. This notion suggests that white people are born more intelligent than black people, which has raised some serious debate and backlash among researchers (Garlick, 2003). While some doubt the usefulness of the IQ test in general, the theory of general intelligence ignores the fact that certain areas of cognitive performance can change over time, such as in different stages of maturity and throughout adulthood (Garlick, 2003). It also fails to recognize that measurements of intelligence do not accurately predict how successful an individual will be in life (Garlick, 2003). It will become clear in the following sections that with further research and technological advancements in brain science, much of what is known about intelligence is rapidly changing and has the potential to alter the way we think about our intellectual abilities.

2.2.2 Fluid intelligence

Given the fact that there is no single way to define our abilities, it is possible that our understanding of intelligence can change based on how it is conceptualized. It is clear that there
are many factors that contribute to what makes a person or successful. For instance, it is possible that an individual can garner a low IQ score, but still proceed to have a successful and fulfilling life. Thus, it is appropriate to wonder if there are more factors in intelligence than a simple score on a test. An alternative definition of intelligence, known as Fluid Intelligence, can be described as the ability to reason and solve problems without the use of prior knowledge (Jaeggi, Buschkuehl, Jonides, Perrig, 2008). Unlike general intelligence, fluid intelligence is much more malleable and does not indicate that high performance in one area is correlated to performance in all other areas. Rather, the premise of fluid intelligence is that people with greater problem solving and reasoning skills will be more successful over a greater range of environments and situations than those without these skills. As such, it is argued that fluid intelligence is correlated more to personal life success in both academic and professional settings than general intelligence (Jaeggi, et al., 2008). In contrast to the stability of general intelligence, it is maintained that fluid intelligence can be improved with practice (Jaeggi, et al., 2008) Specifically, one study found that fluid intelligence can be enhanced with extensive training of working memory, which is the ability to cognitively manipulate and manage multiple units of information in short-term memory (Jaeggi, et al., 2008; Jarold & Towse, 2006). The improvement of fluid intelligence with repeated practice supports the idea that cognitive ability is not a fixed characteristic, given that this definition of intelligence is applied.

While it is seemingly evident that personal success does not have a specific formula, it is plausible that people can improve their ability to solve problems over a range of different environments. This ability to succeed in a range of demanding and complex environments through problem solving and reasoning may be more beneficial to overall life success than measured intelligence. If the idea that intellectual ability can be improved is true, it is important
to consider recent brain science research to gain better insight into the notion that people have the capacity to grow and become more intelligent with repeated practice.

2.2.3 Neural plasticity and long-term potentiation

Through advancements in science and technology in recent years, researchers are beginning to learn much more about the complexity of the human brain and how it operates. With the existence of a general factor of intelligence becoming increasingly challenged, neuroscientific findings have emerged that further validate the notion that intelligence is not a fixed trait (Garlick, 2003). Specifically, scientists argue that learning is a product of increased neural connections in the brain (Garlick, 2003). The notion that the brain is malleable and can change in response to different environments is known as neural plasticity (Nelson, 1999).

Nelson (1999) argues that the brain experiences three major changes in response to environmental stimulation. These include anatomical changes of neural connections, neurochemical changes in the release of neurotransmitters, and metabolic change that constitutes the fluctuation of metabolic activity in response to new learning (Nelson, 1999). Each of these biological changes that take place in response to learning reflect the brain’s ability to adapt and change with new information. To illustrate the plasticity of the brain, one famous study found that when cats were reared in an environment that only allowed them to view vertical lines, they were unable to visually detect horizontal lines later in life (Blakemore & Cooper, 1970). The inability to see horizontality shows how the brain can adapt and change in response to environmental stimulation.

While it has been established that the brain is highly malleable and adaptive, it is necessary to form an understanding of how this change equates to the learning and growth of a human being. To further the idea that the brain experiences anatomical changes in neural
connections, it has been argued that the strengthening of these connections represents the basis of learning (Malenka & Nicoll, 1999). The strengthening and growth of neuronal connections in response to new learning environments is the result of a process known as long-term potentiation, which is the mechanism that explains deep learning and growth (Malenka & Nicoll, 1999). Although the specific mechanisms underlying long-term potentiation are beyond the scope of this paper, it is crucial to understand that the growth of neural connections made in response to learning have a long-lasting effect. With increased learning opportunities and challenges, the brain is able to make deep connections and establish growth over time (Malenka & Nicoll, 1999).

The evidence presented reflects two conflicting schools of thought - one arguing that intelligence is static, and the other suggesting that intelligence is something that can be developed with practice. It is seemingly evident that recent findings and the evolution of scientific research has made it apparent that intellectual ability is not only malleable, but also does not predict overall success in life. Rather, the ability to use reasoning and problem solving may be more conducive for learning and succeeding in a range of complex life tasks. Research shows that people are able to grow intellectually with increased and persistent practice that can have long-lasting effects. In light of this evidence, many students and individuals alike are under the impression that their intelligence is not only fixed, but also defines who they are. The next section discusses some of the barriers and reasons why many students have a fixed mindset, and will provide an understanding of how to appropriately identify those underperforming as a result of this misconception.

2.3 The Barriers of a Growth Mindset

It is not difficult to see why it would be problematic for students to possess a fixed
mindset in the classroom. These students may be under the impression that they are unintelligent, and as a result may not put in the effort necessary to achieve their desired goals. Students with this fixed mindset may never realize their potential and decline great learning opportunities due to a fear of failure or rejection. The evidence on growth mindsets demonstrates that it is beneficial to think positively about one’s intelligence and seek out challenges that expand learning opportunities. Although the benefits of a growth mindset are aplenty, there are certain barriers that impede an individual’s ability to achieve this positive mentality. It is critical that teachers and parents accurately identify these systemic barriers and provide the education necessary to help students believe in their abilities. With this, there is hope that more students pursue their goals and obtain the mentality needed to reach their full potential.

2.3.1 Stereotype threat

One of the major barriers that can prevent a student from achieving a growth mindset is a phenomenon known as stereotype threat. Stereotype threat is the underperformance of an individual due to societal misconceptions and fear of judgments about a particular group’s intelligence (Steele, 1997). This phenomenon is common among certain groups of people that are characterized based on gender, race, and age (Steele, 1997). For instance, it is a societal misconception that African Americans are not as intelligent as their Caucasian counterparts. One study on this particular racial stereotype showed that the way a task is framed can influence performance on a test (Steele & Aronson, 1995). Specifically, Steele and Aronson (1995) tested the abilities of African American participants on an intellectual task and told them that it was either a measure of intellectual ability, or that it was a mundane task that was not intended to measure intelligence. Surprisingly, the researchers found that the participants who were told the test measured their intelligence performed significantly worse than those who thought it was just
a regular task (Steele & Aronson, 1995). The underperformance of the group who thought the task measured their intelligence may have occurred as a result of implicit reconfirmation of negative stereotypes.

It is likely that with increased diversity in schools, students are susceptible to various types of stereotypes that cause this underachievement as a result of a fixed mindset. Whether it is a stereotype based upon race, gender, socio-economic background, or age, these factors can highly influence an individual’s confidence and subsequently impact performance. Negative self-beliefs can restrict an individual’s cognition and cause them to develop a fixed mindset.

### 2.3.2 Learned helplessness

Another major factor that can contribute to academic success is student motivation. It has been argued that regardless of an individual’s intelligence level, hard work and motivation are essential for learning and growth (Dweck, 2010). Dweck (2010) maintains that no individual is born successful, and that even the most gifted people work hard to become successful. Often, some students who underperform tend to lack the motivation and drive that is necessary to achieve optimal results. Students may develop this lack of motivation due to learned helplessness, which is the decreased effort and motivation in a particular task in response to negative feedback (Yates, 2009). Put simply, a student who experiences constant failure in a particular domain may begin to believe they are incapable of improving, and thus lose the motivation to put effort in future tasks because they believe they will continue to fail. The student may begin to experience a false sense of uncontrollability on their academic outcomes, developing the fixed mindset that they are unintelligent (Yates, 2009).

It is critical that educators properly identify the possible reasons for student underachievement. Quite often, teacher judgments may incorrectly reflect a student’s true level
of intelligence and undermine their potential. One study showed how the influence of teacher judgments on the intelligence of students can predict future life success (Fischbach, Baudson, Preckel, Martin, & Brunner, 2013). Specifically, the researchers showed that teacher judgments of the intelligence of 12 year old students was able to predict future life outcomes such as educational attainment, socio-economic success, health, and subjective well-being (Fischbach, et al., 2013) The results from this study illustrate the magnitude of how an impression a teacher may have of a student can really impact their life. The student may begin to feel like a failure and develop a self-fulfilling prophecy about their ability, which can remain with them throughout their life (Fischbach, et al.). The problem, however, is that the teacher may not be accurately judging a student and is undermining their potential. Thus, as educators, it is extremely important that the cause of underachievement is accurately identified, as labels can remain with an individual and impede their ability to succeed. The confidence of a student may be highly dependent on how they think they are perceived by others, which is why it is essential that educators promote the idea of growth and progress for both struggling and excelling students (Dweck, 1976). The next section will explore the ways in which a teacher can build a growth-oriented environment that provides students with the mindset that can contribute to life-long achievement.

2.4 Implementing a Growth-Oriented Classroom

It has been thoroughly demonstrated that a growth mindset may help a student realize their potential and reach goals that may have previously been thought of as unattainable. The mentality of a student can have significant influences on their motivation and confidence needed to succeed academically. Certain barriers including stereotype threat, learned helplessness, and labelling can cause a student to believe that their intelligence is fixed and they are going to
remain at the same level for the rest of their life. Much of the evidence that has been explored suggests that the brain can grow, and that people can improve if they alter their mindset. It can be difficult to obtain this mentality without guidance and practice, which is why the teacher is one of the most important influences on a student’s mind. Implementation of a growth-oriented classroom is not a single lesson, but something that is demonstrated consistently throughout the day and instilled in the minds of students. There are several pedagogical strategies that can be used to foster a growth mindset, each of them contributing to a communal classroom shift in thinking.

2.4.1 The brain as a muscle

One very important way that educators can foster a growth mindset is by teaching students about brain research. While the theory that intelligence is a stable and heritable trait is supported by some researchers, much of the evidence points towards the idea that the brain is capable of making new connections that ultimately leads to learning and growth (Garlick, 2003). Some teachers may shy away from teaching brain research due to its complexity, but the concepts that can be taught are relatively simple and easy for students to understand. The language a teacher uses to talk about brain science can be as friendly as possible, just as long as the underlying messages are present. These messages should illustrate the fact that the brain is not fixed and can grow with practice. For example, a teacher can teach their students to think of the brain as it were a muscle that can grow and become stronger with exercise (Blackwell, Trzesniewski, & Dweck, 2007). In one study, researchers induced either a fixed or growth mindset in students by teaching them that brain is malleable or that it is not malleable. The results showed that students who learned that the brain was malleable showed an increase in academic achievement over time and a positive increase in classroom motivation. In contrast,
those who were taught the brain is fixed experienced a downward trend in achievement and decreased motivation (Blackwell, Trzesniewski, & Dweck, 2007). This study demonstrates how a change in thinking about ones intelligence can build confidence and motivation to learn. Being told that the brain is a muscle does not make an individual more intelligent, but reassures them that they have the ability to improve and overcome challenges.

Teaching about the brain can be extremely simple and beneficial for students of all ages. Applying the principles of neural plasticity and fluid intelligence can help students understand that one bad test will not hinder their academic success. Rather, they may develop a sense of resiliency and be able to learn and grow from their mistakes. Students will understand that each new learning experience, good or bad, creates greater neural connections that makes them become stronger for subsequent challenges.

2.4.2 Celebrate mistakes and embrace challenges

It is a common practice for teachers to provide their students with ‘success experiences’ in which they perform easy tasks that they are likely to be successful (Masters, 2013). The basic premise for this strategy is that students gain confidence through repeated success in unchallenging tasks which then enhances their ability. Although students may feel more confident after succeeding in an easy task, research indicates that there are no benefits to the learning and growth of the individual (Masters, 2013). Masters (2013) argues that when students are constantly succeeding in tasks that do not challenge them, they may enter a comfort zone that never really allows them to expand their abilities. Rather, it is maintained that students learn best when they are challenged slightly beyond their comfort zone - a concept known as the zone of proximal development (Masters 2013). When a student experiences challenges slightly more difficult than they are comfortable with, they are likely to make mistakes in the process. Some
students might feel a sense of defeat or lose motivation after failure, but this usually occurs if they possess a fixed mindset (Dweck, 2007). As such, it is important for educators to positively frame failure and promote the idea that mistakes are essential for growth.

Valuing mistakes as learning opportunities can be a great way for teachers to encourage students to approach challenges (Boaler, 2013). When students make mistakes, fostering a growth mindset can allow them to see failure is an opportunity to improve. These students may take the necessary steps needed to correct any deficiencies and strive towards progression (Dweck, 2007). With a classroom environment that celebrates mistakes as opposed to punishing them, students can feel comfortable and confident approaching challenges with the knowledge that they may not succeed on the first attempt. Students with this growth mindset will begin to understand the relationship between sustained effort and success, which is how true learning can be developed (Masters, 2013).

2.4.3 The proper use of praise

It is human nature to desire the feeling of appreciation and acknowledgement by others after success in a particular task. Whether it is passing a test, performing well in a sporting event, or even helping out with chores, people generally like to have their success recognized. While praise is something that is often used to tell an individual that they did something well, there is a misconception that praise helps to boost an individual’s confidence and self-esteem, indirectly enhancing achievement (Masters, 2013). Recent research has found that there are two types of praise that can be given to a student after a successful performance, each of them having different effects on the individual’s academic achievement and mindset (Kamins & Dweck, 1999).

The first type of praise that may be given to a student after a successful performance is
called ‘person praise’ (Kamins & Dweck, 1999). Person praise refers to the direct praising of the skill or intelligence level of an individual (Kamins & Dweck, 1999). For example, a teacher may tell a student that they are really smart or naturally skilled after attaining a really high mark on a test. It is this form of praise that may have negative effects on an individual, and indirectly induces the student with a fixed mindset (Baumeister, Hutton, & Cairns, 1990; Kamins & Dweck, 1999). When a student is told that they are naturally gifted, they may have difficulty conceptualizing the relationship between effort and success. As a result, they may feel that they do not need to work hard to succeed, because their ability and intelligence alone will sufficiently allow them to succeed in future tasks.

An alternative form of praise that can be delivered to students after successful performance is known as ‘process praise’, which may have beneficial effects on future achievement (Kamins & Dweck, 1990). Unlike person or skill praise that values the natural intelligence of an individual, process praise values effort and determination even when a student is not struggling (Kamins & Dweck, 1990). With this form of praise, a student is able to associate the relationship between effort and success, which can contribute to future successful outcomes. To illustrate the significance of each type of praise, Mueller and Dweck (1998) examined the performance of students who were given one of two types of praise upon successful completion of the same task. They found that students who were praised for their natural ability displayed less task enjoyment, less task persistence, and worse performance in later activities compared to students who were praised for their effort. Those who were told that they “must have worked really hard” continued to show persistence, increased task enjoyment, and greater levels of future achievement (Mueller & Dweck, 1998).

The research on praise suggests that it is beneficial for teachers to refrain from praising
the intelligence or skill level of their students. Even though it may difficult to alter the way in which a teacher praises their students, this small modification can have many implications for developing a growth mindset in the classroom (Dweck, 2007). Students will develop a greater appreciation for effort, become open to challenges, and value mistakes as learning opportunities (Dweck, 2007).

2.5 Conclusion

In this literature review, I explore research pertinent to the concept of the growth mindset and its implications in a classroom setting. The encompassing literature discusses both how and why a growth mindset can be conducive to learning, while discussing the various schools of thought that offer a greater perspective on the field as a whole. Much of this chapter focuses on the concept of intelligence, comparing historical perspectives with more contemporary approaches centralized with brain research and technology. While there is much debate in the field of intelligence, further research is needed and the integration of both perspectives must be taken into consideration. It is clear that students may possess a fixed mindset for a number of personal reasons that hinder their confidence and belief that they are capable of succeeding. It should be a goal for educators to build an environment oriented towards growth and progress to ensure that students reach their full potential.

With my research, I hope to contribute to this conversation by discovering how educators are applying the knowledge of a growth mindset in their classrooms. A great deal of literature surrounding the growth mindset focuses on what it means for the individual, but there is still much to be learned about how it is applied in a real classroom setting. I expect to gain a better understanding of the practical methods and pedagogical strategies teachers and principals are
using to foster a growth mindset, and analyze the tangible outcomes that students experience from this practice.
Chapter 3: Research Methodology

3.0 Introduction to the Chapter

In this chapter, I provide a comprehensive description of the research methodology used throughout this study. I begin with a description of the research approach and procedures used, as well as a review of the instruments that aided in data collection. I then outline and briefly identify the participants in the study, while illustrating the sampling criteria and methods of recruitment. I proceed to shift into an explanation of how I analyzed the data, followed by a thorough discussion of the ethical considerations that are essential to this study. Next, I provide an evaluation of the methodological limitations of qualitative research, while also alluding to the strengths of the methods as well. Finally, I conclude this chapter with a brief overview and rationale of methodological decisions, in addition to an outline of what is to follow in the subsequent sections.

3.1 Research Approach & Procedures

This study was conducted using a qualitative research approach that includes a review of key literature pertinent to the research purpose, as well as a semi-structured interview with one elementary teacher and one elementary principal. It was important to interview a diverse range of educators within the elementary school system in order to gain a more comprehensive analysis of the research and findings. A qualitative research approach is an invaluable method of data analysis, specifically for educational research because it allows for an interpretation of ideas and findings which can be linked to existing literature (Bogdan & Biklen, 2003). This enables the researcher to identify the underlying themes and patterns in the data, with the potential to magnify or add to what is already understood about a particular field of knowledge (Bogdan & Biklen, 2003).
Because educational research is not a “hard” science and its findings are largely unquantifiable, the most crucial elements of the qualitative research approach are the interpretation and critical analysis of data (Bogdan & Biklen, 2003). Bogdan and Biklen (2003) contend that qualitative research is best conducted if the researcher makes appropriate decisions that narrow the study, develops analytical questions that are correspondent with the main research purpose, and continuously aims to interpret and make sense of the data. Fossey and colleagues (2002) suggest that qualitative research is not a uniform method, but that there are multiple facets and paradigms that a researcher is able to consider. Interpretive research is one paradigm that is fundamental to the idea that we are able to make meaning and gain a greater understanding of findings through the accounts of human experience and action (Fossey et al., 2002). This specific paradigm of qualitative research was particularly relevant to the current educational research study, as I used it to interpret and organize the accounts and experiences of the participants in order to apply it to existing literature.

In brief, a qualitative research approach is valuable tool in that a researcher is able to generate meaning through interpretation and critical analysis of data. With this, a researcher is able to apply and organize the data with existing literature and findings. To maximize the efficacy of qualitative research, it is critically important that participants’ accounts are interpreted with authenticity, and that the findings are congruent with the participants’ perspectives in their particular social environment (Fossey et al., 2002).

3.2 Instruments of Data Collection

The prominent instrument of data collection was used in this study is semi-structured interviews that were conducted between myself and the selected participants. Semi-structured interviews consist of a set of predetermined questions that are intended to elicit a specific
narrative (Aleandri & Russo, 2015), in this case pertinent to the research purpose and questions. The interviewee was able to tell stories based on their experiences, which then helped to prompt future questions asked in the interview. As such, I was prepared to ask questions that relate to the interviewee’s responses, even if they are slightly different than the questions I had predetermined. My research was specific to analyzing the pedagogical strategies of educators and their experiences of evoking a growth mindset in their students, while evaluating the outcomes they have observed in their practice. As such, the questions in the interview were all centered around this central narrative and were intended to draw out the experiences, attitudes, feelings, and thoughts of the selected participants.

The interviews took place in settings that allows face-to-face interaction, which also enabled me to gauge and consider the non-verbal aspects of communication such as body language, emotion, and expression (Aleandri & Russo, 2015). Irvine, Drew, and Sainsbury (2012) suggest that face-to-face interaction is an essential element of semi-structured interviews because it encourages the two individuals to establish rapport and allows for a ‘natural’ encounter, which are fundamental to conducting effective qualitative research. Moreover, an in-person interview was advantageous because the interviewer can effectively monitor responses and address any confusion that may arise in the dialogue (Irvine, Drew, & Sainsbury, 2012).

The predetermined questions that were asked were organized into five broad sections that all aimed to elicit a specific dialogue between myself and the interviewee. The first section of questions began with establishing rapport and exploring participants’ background information followed by a subset of questions pertinent to their beliefs and perspectives of what it means to foster a growth mindset in their students. Subsequently, the following section related to the pedagogical strategies these educators have used to promote a growth mindset and any tangible
outcomes they have observed. The final two subsets were focused on the challenges and limitations that this small sample of educators have experienced in the implementation of growth mindset pedagogy, as well as any further advice or next steps they have to offer to future teachers. Some example questions (a few of which are listed in Appendix B) are as follows:

- In your view, is intelligence a stable characteristic that a student is born with, or is it something that can be improved over time? How does this influence your pedagogy?
- What strategies have you used to help a student who has developed a lack of motivation or learned helplessness?
- What methods do you practice that encourage students to take risks and face challenges, even when failure is a possibility?

3.3 Participants

In this section, I outline my criteria that was used for sampling educators interviewed, as well as the procedures and rationale I used for recruitment. To conclude this section, there is an area designated for specific information about the participants I have chosen, in addition to an explanation as to why they were suitable candidates to contribute to this research.

3.3.1 Sampling criteria

The following criteria will be used in participant recruitment:

1. Educators must have a minimum of five years of teaching experience
2. Educators must work in an elementary school and have taught in primary and/or junior grade levels
3. Educators must be committed to and have experience with implementing a growth mindset in their classroom, or have been involved in a leadership role pertinent to growth mindset activities.

4. One participant will be a teacher, while the other participant will be a principal who is a leader in their school community in creating a growth oriented environment.

In this small sample of educators, it was important that the criteria listed was met so that I was able to obtain an accurate representation of data pertaining to my research purpose. First, it was critical that the educators I interviewed had a minimum of five years of teaching experience. I established this criterion because those with more experience are likely to have attained a greater understanding of the different backgrounds, age ranges, and learning needs of students they have taught. I am curious to learn if there are any patterns or trends that they have observed over their many years of teaching and across different grade levels. The second criterion that I established is that the educators must be currently working in an elementary school and have taught in primary or junior grade levels. Although the data obtained cannot be generalized to a larger population of students, it is important that the data I obtain aligned with my research purpose which was centered around primary/junior students and teachers. The next criterion that I have established for recruitment is that my participants must have experience in the implementation of a growth mindset in their classrooms, or have previously been involved in a leadership role pertinent to growth mindset activities. I chose this criterion based solely on the fact that my research purpose was to explore the strategies teachers use to promote a growth mindset and learn about any tangible outcomes they have observed in their practice. Lastly, it was important for my research that I interviewed a broad range of educators so that I had a better understanding of how a growth mindset is fostered in a classroom as well as the larger school...
environment. As such, I decided upon interviewing one teacher and one elementary school principal to learn about the growth oriented leadership they have in their implemented in their specific school communities.

3.3.2 Sampling procedures

To recruit participants, I drew on a variety of methods that enabled me to efficiently select adequate participants for this study. One method that was used to recruit participants was purposeful sampling, which is the selection of participants within an area of the population who have an abundance of information or knowledge of the topic of interest (Guarte & Barrios, 2006). In relation to the study at hand, the participants were a subset of educators who have experience and knowledge in the implementation of a growth mindset in their classrooms/school environment and meet all of the requirements to be considered for participation. To fulfill this purposeful sampling, I contacted a principal I have encountered in a previous role within a school. This candidate fully embodied the meaning of being a leader in building a growth oriented school community.

Another method I used to recruit participants is a subset of purposeful sampling, called snowball sampling. Snowball sampling is a type of purposeful sampling that a researcher uses by finding suitable participants along the way or by asking existing participants to refer others who have extensive knowledge in a particular area (Frank & Snijders, 1994). I utilized the networks with my fellow teacher candidates and educators I have encountered to connect with suitable teachers who were willing to participate in this study.

3.3.3 Participant bios

My first participant was Robert who, at the time of the study, was a principal in a middle school in the Peel District School Board. Robert has been a principle at three different schools
over an eight-year span, and has taught primary, junior, and intermediate grades for eight years prior. Robert was involved in multiple leadership roles alongside his duties as a principal such as coaching multiple teams and leading professional development seminars. He was a progressive educator who strives to create a school community oriented towards growth.

My second participant was Joanne, who has been a full time teacher with the Halton District School Board for five years at the time of this study. Joanne has taught Grades 4, 5, and 6, and has also been a special education resource teacher during the duration of her career as an educator. Alongside her regular duties as a teacher, she was a leader in the school community as she was involved in many different groups including eco-club, healthy schools, and diversity clubs. Joanne truly showed commitment to fostering a growth mindset in her students and displayed all the requirements for being a participant in this current study.

3.4 Data Analysis

One of the most critical elements of qualitative research is data analysis, which occurs both during and after all the data has been made available, leaving the researcher to interpret and organize all of the information they have obtained. While much of the interpretation and analysis of data is conducted after it has been collected, Bogdan and Biklen (2003) propose that researchers are able to construe and organize data throughout the entire research process. This can be accomplished by continuously forming observation notes during interviews so that all information, both verbal and non-verbal, are accounted for (Bogdan & Biklen, 2003). Bogdan and Biklen (2003) also suggest that a researcher is able to obtain a greater sense of meaning of the data by writing memos during the data collection process about what they are learning, capturing themes that may not have been explicitly stated by the interviewee.

After the data has been collected, the researcher can use a multitude of available methods
to aid in data analysis. The most common method, and a method in which I analyzed my data, was through constant comparison analysis (Leech & Onwuegbuzie, 2007). Constant comparison analysis is qualitative data analysis approach that a researcher uses to properly organize information into meaningful units, or “codes”. These codes represent themes that are interpreted by the researcher, which are then grouped by similarity (Leech & Onwuegbuzie, 2007). I used the data obtained in my recorded interviews to create meaningful codes or chunks of information obtained from the three participants. The data was then sorted into these categorizes, grouped with other similar themes, and then further analyzed. This method of data analysis is primarily used to organize information in a manner that allows the researcher to easily access and decode further meaning. Other methods of data analysis that I used to organize and interpret themes in the data include keyword in-context analysis, which categorizes and counts the number of key words that are used by participants in the two interviews, and classical content analysis, which is related to constant comparison analysis except it counts the number of times a certain code or theme is made explicit (Leech & Onwuegbuzie, 2007). The general goal for these methods is to discover over-arching themes across the entire data set, while also interpreting for further meaning.

With respect to the current study, data analysis was conducted through semi-structured interviews that was audio recorded. I then transcribed the three recorded interviews and began data analysis using constant comparison analysis, keyword in-context analysis, and classical content analysis, which aided in the interpretation and organization of information.

3.5 Ethical Review Procedures

Although it is claimed that quantitative research is more ethically problematic than qualitative research, Brinkmann & Kvale (2005) contend that both types of research have ethical
considerations that must be taken into consideration. The ethical dilemmas that arise from qualitative research are based on the idea that researchers studying and investigate the private lives of participants and make this information available to the public (Brinkmann & Kvale, 2005). As such, the researcher must be cognizant of all of the ethical factors that arise in their qualitative studies, which include issues about confidentiality and consent, the right to withdraw at any point, discussion of any risks of participation, member checks, and methods of data storage.

The issues of confidentiality and consent was addressed by providing the participant with a letter of consent (Appendix A), and by assigning them a pseudonym that allowed their personal identification to remain undisclosed. Furthermore, the participant was granted the right to withdraw from the interview at any point if they felt uncomfortable. This allowed the participant to feel free of any pressure they may have had answering certain questions. As such, participants also had the right to pass on any questions they did not wish to answer. The issues mentioned thus far represent micro-ethics, which are largely unproblematic and can be addressed rather easily (Brinkmann & Kvale, 2005). There were no known risks to this study, as it was a semi-structured interview about the role of a growth mindset in the classroom.

Although the participants were assigned pseudonyms to remain confidential, they had the ability to review transcripts of the interviews to ensure that all information was accurate. This ethical principle that was addressed is related to macro-ethics as it is important to consider how this information was interpreted and made available to the public domain (Brinkmann & Kvale, 2005). If information in the transcripts happened to be flawed or inaccurate, the participant was able to make any changes necessary before it is analyzed and made public. Lastly, all audio data was be stored on a password protected phone/computer/tablet and will be destroyed five years
later. Southall (2009) contends that there are specific ethical dilemmas that can arise with the re-useage of audio data in non-related contexts outside of the current research project. These include the potential for data to be used for other purposes, as well as the potential for voices to be recognized that would breach the confidentiality agreement (Southall, 2009). It was important that the data was used solely for the purpose of this research project, and not for any other reasons. As such, by destroying the data, the participants can be assured that their data remains confidential and within the confines of the current study.

3.6 Methodological Limitations and Strengths

The main limitation of the current study is a result of the restrictions in place that allow for only a small number of participants to be interviewed. Due to the nature of this project and parameters that have been set in place, teachers and principals are the only participants that were available to take part in the study. There are a range of perspectives that are unable to contribute to this research, including those from parents and from the students themselves. According to Johnson (1997) this limited range of participants could potentially compromise the validity of the study. For instance, the lack of student and parent data could threaten the descriptive validity, which is the accuracy between participants’ accounts and what actually occurred in reality. In this particular study, descriptive validity could be influenced because the teachers/principal’s description of their observations after inducing a growth mindset might not accurately represent how students feel or what actually occurred. Another type of validity that may be threatened by the limited number of participants is external validity, which refers to the extent to which the findings could be generalized to a larger group of individuals (Johnson, 1997). Results obtained from interviews with two educators are not generalizable across populations.

While there are some drawbacks to qualitative research using semi-structured interviews,
there are also advantages to this approach that should be considered. First, Leech and Onwuegbuzie (2007) claim that qualitative research is unique in that it allows the researcher to obtain information that is in close proximity to the specific environment from which it arises. As the researcher, I interviewed experienced teachers who have been immersed a variety of classroom settings and have witnessed and observed the outcomes of growth mindset implementation first hand. Another advantage of qualitative research is that it allows the researcher to interpret and make sense of the meanings of the participants’ lived experiences, which is something that quantitative research lacks (Leech & Onwuegbuzie, 2007). The researcher is able to establish a relationship through natural dialogue between themselves and the participant, and is able to understand and interpret the emotional aspects of the conversation. Furthermore, qualitative research is beneficial in that it is complementary to quantitative research and can be used to strengthen or further validate the findings in previous studies and literature (Leech & Onwuegbuzie, 2007). It was my intention to use the research findings I collected to strengthen existing research on growth mindset, adding a new layer and different perspective to the discussion.

3.7 Conclusion

In this chapter, I provided a comprehensive discussion of the methodology that was used to conduct my research. I began with an overview of the research approach and procedures that I chose to guide my study, with an explanation of my rationale for these decisions. I then listed the primary instrument of data collection, which are semi-structured interviews with predetermined questions that are divided into five distinct categories. The next section examined the participants in my study, which also focused on the sampling criteria and sampling procedures that were used to recruit the participants were interviewed. Thereafter, I discussed the methods of data analysis I
utilized, which include constant comparison analysis, keyword in-context analysis, and classical content analysis. These analytical methods are used to organize the data into “codes”, or themes, which were then further analyzed and interpreted for patterns and meaning. In the subsequent section, I considered the ethical review procedures for qualitative research approaches, with specific discussion pertinent to semi-structured interviews. The ethical factors that were addressed include issues related to confidentiality and consent, the right to withdraw at any point, risks of participation, and the storage of audio data and transcriptions. Lastly, I examined the methodological limitations of this study, but also considered some of the benefits of qualitative research and the semi-structured interviews that were used in the current research project. In Chapter 4, I report on the results and research findings.
Chapter 4: Data Analysis

4.0 Introduction to the Chapter

In this chapter, I describe, synthesize, and analyze the key findings that have surfaced through the semi-structured interview process. The findings emerged from two interviews with one teacher and one principal, which was intended investigate how growth mindset is not only being established in the classroom, but in the entire school community. While conducting interviews and later analyzing the data in relation to prior research, I was cognizant of my primary research question: How is a sample of educators fostering a growth mindset in their students and what outcomes do they observe from their efforts? Through this process, I organized the data into four main themes that connect the research question to key findings from the interviews, while making reference to the Chapter 2 literature review. The four themes are as follows:

1. The definition of a growth mindset was central to how the participants conceptualized intelligence and the role of self-confidence in students.
2. Personal definitions of intelligence shaped teaching and assessment strategies through the consideration of different learning styles and emphasizing individuality in the classroom.
3. Teachers assessed student performance through a growth mindset orientation by providing descriptive feedback and encouraging students to understand the value in continuous effort.
4. The role of challenges and learning from mistakes was viewed as an integral part of student growth which was demonstrated by changing the way failure is conceptualized within the classroom.
In addition to these four primary themes, I have also divided each of the themes into sub-themes that provide more depth and detail into the specificity of findings from the viewpoints of the interviewees. I begin each theme by describing what was found and provide concrete examples using participant voice. Next, I describe the significance of the findings in relation to existing research on growth mindset.

4.1 The Definition of a Growth Mindset was Central to how the Participants Conceptualized Intelligence and the Role of Self-Confidence in Students

Identifying the participants’ personal definitions of what a growth mindset means to them is imperative for understanding how they are utilizing this knowledge in their practice. In order for a teacher to create a classroom climate oriented towards personal growth, the participants emphasized how important it is for teachers themselves to truly understand how this is accomplished in practice. It was clear that both educators recognized the fundamental concepts underlying a growth mindset, and this was reflected in their interpretation of the use of this powerful tool in their classroom. Their personal definitions of what a growth mindset is and how it is applied was demonstrated in three main ways. First, the participants both exhibited an emphasis on the conceptualization of intelligence as a malleable and unfixed construct, which highlighted the idea that each student has their own individual potential that is not limited. Secondly, the participants both maintained that a growth mindset was closely related to an individual’s resiliency and response to constructive criticism in light of adversity. Lastly, the participants brought attention to the idea that language greatly influences thought, which underlined the importance of positive self-talk as a tool for developing a growth mindset.
4.1.1 The participants both contended that while they believe the brain is malleable and each student has their own individual potential, there are a variety of external influences that reinforce a fixed mindset.

Both participants emphasized the importance of understanding that the brain is able to change and grow over time, which is one of the underlying principles of a growth mindset. Through this perception of intelligence, these educators claimed that they were able to support students in believing that their brain is akin to a muscle that grows with struggle and practice, even when students were influenced by external factors that have caused them to adopt a fixed mindset throughout their lives. Joanne stated that “Many students have very solid or even preconceived ideas that have been ingrained in them for many years and are hard to change.” She approached these fixed attitudes by asking these students to make a simple and attainable change through one-on-one conferencing and goal setting. On a similar vein, Robert attested the high incidence of fixed mindsets in the classroom to traditional schooling by claiming that “[teachers] don’t encourage [students] to explore, we write them off”. Robert believed “growth mindset is related to creative thinking” and that “it’s about raising the bar and knowing that everyone has a greater ability for learning.” Both Robert and Joanne expressed that while fixed mindsets are difficult to change, intelligence is something that can be improved. The high prevalence of fixed mindsets in the classroom can be attributed to learned helplessness, which Yates (2009) argues is an individual’s decreased effort and motivation in a particular task due to negative feedback. Due to constant failure and feedback from others, students can begin to feel a false sense of uncontrollability of their capabilities (Yates, 2009). As such, while students may have preconceived beliefs about their abilities that result in a fixed mindset, teachers’ fundamental
understanding of growth mindset and the utilization of various strategies in the classroom can help to build confidence and reinforce the idea that intelligence can be improved.

4.1.2 A major indicator of a growth mindset was related to how students responded to adversity and challenges

In addition to brain malleability as an underlying premise of defining a growth mindset, both participants suggested that the way in which students respond to challenges is a major factor attributed to growth mindset. Joanne and Robert each noted that students with a growth mindset were able to accept critical feedback, learn from failure, and have a positive attitude toward challenging tasks. In particular, when asked what a growth mindset means to her, Joanne answered by saying “it’s about accepting challenges and having an ‘I can do it’ attitude anywhere you go”. Furthermore, Joanne also posited that students with a growth mindset “are flexible and able to learn from mistakes and errors, which is crucial”. While Robert also understood the idea of learning from mistakes and feedback, he emphasized the role of risk taking to achieve individual growth. Robert argued, “I see risk taking in line with scaffolding in their own zone of proximal development. Students need to take risks within their own zone of development in order to get to the next steps.” This line of reasoning coincides with that of Masters (2013) who claims that when students choose to partake in relatively easy tasks that do not challenge them, they stay within a comfort zone that does not allow them to stretch their thinking. The learning that occurs when students are challenged is a product of and long-term potentiation in which neural connections in the brain make new connections that become strengthened over time (Malenka & Nicoll, 1999). The strengthening in neural connection serves as the basis for all learning, which suggests that all students can benefit from making mistakes and being challenged outside of their comfort zone.
4.1.3 A growth mindset was recognized by positive self talk and optimistic beliefs about ability

The idea that the language an individual uses influences their thinking was viewed as critical in the development of a growth mindset. The more positive language an individual uses to describe themselves and their abilities, the more they will start to believe it. Both Robert and Joanne stressed the importance of students engaging in positive self-talk, having an optimistic attitude about their abilities, and behaving in other ways that promote progress in the classroom. To illustrate, Joanne provided an anecdote of a student who would say negative things about herself such as “I hate this”, “I can’t do this” and “I’m terrible”. Joanne stated “whenever she used this language I’d prompt her to change her thinking with positive language to things like ‘I can’t do this yet’”. Joanne discussed the dramatic changes in this student’s academics that occurred as a result of this shift in language. She proclaimed that the student “started to enjoy it, she tried harder problems, her marks increased, and she wasn’t afraid to make mistakes”. The adjustment this student made in her language seemingly increased her confidence, which in turn, allowed her to experience more positive attitudes towards school and also achieve greater success. Further to this, Robert discussed the value in self-belief in mathematics. “Someone who isn’t good at math says they aren’t a math person. This is simply not true. Everyone can be a math person if they have the right mindset”. So often, students’ attitudes and beliefs about their potential are clouded by societal judgments about factors such as gender, race, age, and cultural identity (Steele, 1997). This idea, known as stereotype threat, is the phenomenon in which individuals underperform in academic tasks as a result of societal misconceptions about their groups’ abilities (Steele, 1997). That is, some people may falsely believe they are not good at a particular subject like math or science purely because of their physical attributes or cultural
group they belong to. Both participants suggested that by immediately and consistently correcting negative language about self-abilities in the classroom, students can begin to gain self-confidence and optimistic views in areas of learning where they may have had negative attitudes.

4.2 Personal Definitions of Intelligence Shaped Teaching and Assessment Strategies

Through the Consideration of Different Learning Styles and Emphasizing Individuality in the Classroom

Understanding that each and every student in the classroom possesses their own unique skillsets and abilities was fundamental to both participants in the study. The need for differentiated instruction by challenging each student individually and also supporting each student by considering their learning styles was said to be crucial for establishing a successful learning environment. The participants’ personal definitions of intelligence were reflected in both their teaching and assessment strategies in two central ways. First, both Robert and Joanne’s pedagogies were influenced by the idea of multiple intelligences, which is the notion that each student may possess their own learning style and strengths which must be accounted for in order to bring out their full academic potential. Second, an emphasis on critical thinking skills was considered to be a quintessential aspect of any classroom task or activity since it allows for self-reflection and also encourages creativity. While both participants did see value in explicitly teaching intelligence research to students, some key challenges were made apparent.

4.2.1 The consideration of multiple intelligences was evident as student individuality was emphasized through differentiated instruction, creating individual learning goals, and engaging students through free choice

Whether students are excelling or struggling, are strong in mathematics or strong in language, tailoring the program to meet the needs of each student was a common theme between
both participants. Joanne found value in learning about students’ strengths and weaknesses by having them “put their heads down at the beginning of the year and ask them about their mindsets and their learning styles”. Joanne stressed that learning about who her students are and what they believe about themselves is one of the first things a teacher should do in order to differentiate both the product and process for each student. In a different manner, Robert emphasized the idea of “discovering your own intelligence” as a student, and believes a teacher has to “alter the expectations.” Robert continued by noting that a teacher should begin by “getting students to understand who they are as a learner, then [they] do gap analysis. This is basically where [students] are now, versus where [they] want to be, and knowing how to get there”. Robert suggested that the best way to achieve this is through individual conversations and the co-construction of student goals along with the steps needed to achieve them. Further, both Joanne and Robert alluded that all students should be granted the opportunity for inquiry projects and free choice. While Robert argued that allowing for choice and inquiry “engages” and “hooks” students, Joanne saw inquiry as an opportunity for students to “stretch their thinking”. Joanne spoke about giving students booklets with outside of the box questions, such as brain teasers and ‘extend your thinking’ challenges because she feels that is important for students to understand that not everything is done quickly and easily. The use of differentiation and encouraging student individuality through inquiry and choice-based activities mirrors what contemporary intelligence research has found. Put simply, the general factor of intelligence which argues that strength in one area of intelligence predicts strength in all other areas of intelligence has been shown to be inaccurate (Garlick, 2003). Rather, research suggests it is the ability to solve problems and use reasoning, a concept known as fluid intelligence, that explains how individuals are able to be successful (Jaeggi et al., 2008). Further research on fluid
intelligence contends that individuals can have strengths and weaknesses in particular areas of learning, but that they can improve in certain skills over time (Jaeggi, et al., 2008). As such, both participants expressed the need to encourage students to stretch their thinking and problem solving skills in multiple ways in order to improve in all areas of learning.

4.2.2 Both participants highlighted the importance of critical thinking skills as a tool for personal growth which was demonstrated through student reflection and emphasizing the process over the product

Allowing students to reflect on their thinking in various ways was found to be a major factor in establishing individual growth. Whether it is before, during, or after a given task, critical thinking and reflection were said to not only enhance the quality of learning, but also make the content more meaningful. Both Robert and Joanne believed that critical thinking is at the core of growth mindset, but had distinct methods in which they promote this type of reflecting. As a principal, Robert mentioned that he encourages his teachers to establish a critical thinking framework through what he labeled as the “Five Key Questions” which is derived from a book called Putting Faces on the Data by Lyn Sharrat. Robert described the five key questions as “What are you doing? How are you doing this? How do you know? How can you improve? And where do you go for help?” These questions are a staple within every classroom in Robert’s school and teachers are encouraged to imbed this framework into every task that they do. This type of reflection is said to “have a major impact on growth mindset” because it allows students to reflect every aspect of their work and have them think of ways they can improve. Using a different strategy, Joanne asserted that she fosters critical thinking in her students by having them create a reflection book that has goals related to growth mindset. Joanne added, “It worked well and allowed me to work one-on-one with students. It allowed me to see who needs extra
support and who needs to understand what proper goals are in relation to growth mindset”. Both the five key questions utilized by Robert and the reflection book employed by Joanne place emphasis on the process of student work, rather than the final product. The importance of accentuating the process of student work as opposed to focusing on the final product aligns with Kamins & Dweck’s (1990) research on ‘process praise’. When students are praised for their process they are able to make associations between effort success, which in turn helps to foster a growth mindset (Kamins & Dweck, 1990). Thus, by implementing a program that allows students to critically reflect on their performance, teachers are able to observe and assess individual progress and how students think about their work.

4.2.3 Directly teaching students about intelligence research was something that is valued in theory, but in practice posed pedagogical challenges

While both participants saw value in explicitly teaching students about brain science and intelligence research in order to explain what a growth mindset is, they both encountered challenges related to the nature of these types of resources. Specifically, while they noted that there was a lack of resources in general, the materials they have used to teach about the brain have been written using technical science jargon which can be difficult to understand, especially for younger students. Joanne noted, “I definitely would [teach intelligence research] but it’s just a matter of finding these resources. I did try to bring in some of the hard science behind it but it was very difficult to be engaged. I struggled with simplifying the language.” When asked to explain what some of the responses from students were, Joanne mentioned that “the older ones respond much better than the younger ones. It’s night and day between the [grade] fours and [grade] eights.” As a principal, Robert voiced that his main challenges with teaching intelligence research is “having teachers buy into it, changing the way they do things.” Robert contended
that in order to effectively teach about how the brain can change and grow, teachers must first believe in it themselves. Blackwell, Trzesniewski, & Dweck (2007) suggest that teaching students about brain science research can be a relatively simple process that involves having students understand that the brain is a muscle that is able to become stronger with practice and exercise. While thinking of the brain as a muscle appears to be a straightforward method to teach students about intelligence, the research does not account for the lack of educator-friendly resources that can be used pedagogically, as outlined by the participants.

4.3 Teachers Assessed Student Performance Through a Growth Mindset Orientation by Providing Descriptive Feedback and Allowing Students to Understand the Value in Continuous Effort

Assessment of student performance in light of individual growth was said to allow students to understand that their effort and determination to progress is noticed by teachers. This section describes the ways in which the participants’ methods of assessment were reflective of a growth mindset orientation. This is particularly important because students can benefit from receiving tangible feedback from teachers that acknowledge their personal growth in areas of learning over time. In addition, assessment of student performance in relation to a growth mindset can provide students with the steps needed to continue working towards achieving their goals. Both participants in the study considered individual growth and progress in their assessment of student performance in three main ways. First, providing descriptive feedback through individual conferencing and writing comments on student work was found to be an important tool for ensuring that all students are able to work towards their own individual goals. Second, both participants demonstrated an understanding of the policy in place that ensures students are being assessed in relation to individual progress. Finally, the participants expressed
that it is necessary for all students to experience a sense of success by tangibly rewarding them for their effort and determination in the classroom.

4.3.1 Providing descriptive feedback through conferencing and writing comments on student work was considered essential for fostering personal student growth

Both participants expressed the value in providing descriptive feedback to students in multiple ways to facilitate individual progress. It was noted that it is important to provide this feedback not only after a task, but during the task as well. For instance, as Joanne stated, “I take the whole process into consideration during the assessment rather than what they produce at the end. This is emphasized during the reflection portion and feedback I provide to students”. Joanne indicated that her students use a reflection book that allows her to provide written feedback and on-going dialogue between herself and the students. While written feedback was considered a fundamental part of promoting individual growth, Robert also stated that much of this descriptive feedback should occur in individual conferences with students. In fact, Robert suggested that one of the most impactful things a teacher could do to foster a growth mindset is related to oral conferencing. “It’s really emphasized by one-on-one conversations with teachers. Co-creating goals together and the steps to get there is so crucial for development”. In addition, Robert posited that this goal setting can be done in a whole group but that it is “more effective when done privately with each student. This way you can properly identify this student’s gap analysis and take them to where they need to be.” Much of what has been learned about the value of descriptive feedback both orally and written echoes prior research that has been conducted on the use of praise. Dweck (2007) stresses the importance of refraining from over-celebrating student accomplishment but rather adding more value to the process or ‘journey’ that each student endures while completing a given task. By acknowledging and providing feedback on the
process of work, students can develop a greater awareness of the relationship between effort and success, and will begin to value these mistakes as opportunities for learning. To further this point, Mueller and Dweck (1998) also demonstrated that students who are given feedback of their process in a task are more likely to show persistence and task engagement that can lead to greater academic outcomes. The benefit of written feedback was acknowledged by Joanne as she saw value in continuous teacher-student dialogue in reflection books. However, as Robert suggested, this feedback can also be delivered orally in student-teacher conferences to discuss both performance and behavior goal-setting.

4.3.2 Both participants demonstrated an understanding of the policy in place that ensures students are being assessed in relation to individual progress

Joanne and Robert each discussed the connections between the Growing Success Policy (2010) and assessing with a growth mindset perspective. Growing Success (2010) is a document mandated by the Ontario Ministry of Education that outlines the ways in which teachers are to assess each student so that they are able to reach their own individual potential. Robert described Growing Success (2010) as a policy that “links achievement to improvement.” Robert also added, “The Growing Success policy indicates that we should focus on the most consistent and most recent marks, not average. Grading averages doesn’t focus on growth.” In a similar light, Joanne utilized Growing Success (2010) by “[taking] the whole process into consideration during assessment rather than what they produce at the end.” Joanne suggested that she considers the individual progression of her students and will how much initiative and risk taking was involved in the process. Both Joanne and Robert’s assessment strategies directly follow Growing Success (2010) which is ultimately in place to help foster individual student progress and goal-setting. For example, Growing Success (2010) maintains that evidence should be gathered by teachers to
“monitor students’ progress toward achieving the overall and specific expectations, so that teachers can provide timely and specific descriptive feedback to students, scaffold next steps, and differentiate instruction and assessment in response to student needs. As such, the way a teacher frames their use of assessment in the classroom using a growth oriented model can give students the impression that learning and progress is more important than overall grades. By considering the most recent and consistent evidence, students will not be deterred or hindered by their previous performances.

4.3.3 Educators placed an emphasis on ensuring that all students experience a tangible reflection of their effort by rewarding them with experiences of success

While process praise and the celebration of effort allows a student to understand that their persistence and determination has not gone unnoticed, the participants felt that it is important to allow students to experience success in more concrete ways. Robert brought attention to the fact that instilling confidence in students can have an immense impact on their future performance. “The teacher has to bring the bar down a bit and let [students] achieve some success, then build up again from there. Sometimes you have to take two steps back to take a step forward. Confidence is key”. To build confidence in students, Robert considered re-establishing student goals and giving them the opportunity to know what success feels like. On the other hand, Joanne also sees value in allowing students to experience success but does so in a different manner. She expressed this by saying, “I look at overall marks, but I don’t mind giving [students] a stronger mark if I notice they have been trying harder and making progress throughout the year.” In addition, Joanne provided of an anecdote wherein she described a specific student’s grading justification. “I just couldn’t bring myself to give him a C+ when I saw how much effort he put in so I rewarded him for it. He deserved it.” Prior research on growth
mindset demonstrates an awareness of the value in developing student confidence, yet it is generally argued that “success opportunities” will not benefit learning if the task is too easy (Masters, 2013). Although both Robert and Joanne are cognizant of the fact that students learn the most when slightly challenged, they believe that a high level of self-confidence and belief in ability must be established before students are ready to tackle challenging problems. All considered, the participants understand the fundamental principles of learning, but strive to create a balance between establishing success through building confidence and working towards challenges.

4.4 The Role of Challenges and Learning from Mistakes was Viewed as an Integral Part of Student Growth Which was Demonstrated by Changing the Way Failure is Conceptualized Within the Classroom

Mistakes and failure are often perceived by students as a reflection of their incompetence or inability in a certain area of learning. In turn, students can be deterred from learning as a result of the lack of confidence that may develop through constant failure. In order to foster a growth mindset, however, the participants altered the meaning and implications of challenges, mistakes, and failure by framing these as opportunities to improve. Changing students’ mindsets about failure and how the brain is able to adapt and become stronger as a result is important because it gives students reassurance that they can recover and actually improve in the face of adversity. The participants reshaped the meaning of mistakes and failure in two fundamental ways. First, the educators emphasized the value of struggle by modelling growth mindset behaviour so students can understand that errors should not diminish their confidence. Finally, they encouraged providing students with individually-tailored challenges that are not for formal assessment, but are intended to induce struggle and problem solving.
4.4.1 Teachers frame mistakes and challenges in a positive light by modelling growth mindset behavior so that students can appreciate the value of learning from struggle

It became clear that both Robert and Joanne believed that a teacher’s behavior plays a key role in the degree to which students adopt a growth mindset. Both participants spoke to the modelling of growth mindset behavior by openly making mistakes and providing students with examples of how they and others have succeeded through growth oriented thinking. For example, Robert accredited his own adoption of a growth mindset to the challenges he embraced throughout his life as a high school student and as an educator, coach, and father. He explained, “I got my Master of Education to show my kids that I can do this, while coaching two hockey teams and teaching. If I had a fixed mindset a would have written myself off a long time ago.” Robert often tells these personal stories of success to his students and describes how he overcame challenges to get to where he is today. He attests that his stories resonate with students because it gives them a sense of hope and belief that they can overcome similar challenges. In the same way, Joanne articulated the importance of modelling growth mindset behavior by the language she uses and stories she tells. “It should be in everything [teachers] do and in the language [they] use. They need to see you set a good example and tell stories about how it can actually work.” It is clear that both participants expressed their understanding for not only talking about growth mindset with their students, but also telling personal stories of success and modelling what it looks like in practice each and every day. To highlight this idea, Boaler (2013) asserts that teachers should value mistakes as learning opportunities and that discussing the positive outcomes that arise from difficult situations can be a way to encourage them to approach challenges with an optimistic attitude. This means that modelling what growth mindset looks
like, sounds like, and feels like through past success experiences can instill confidence and a positive outlook on challenges.

4.4.2 Not all classroom tasks need to be formally evaluated, especially those that are intended to individually challenge students and induce a sense of struggle and problem solving

The educators in this study promoted the idea of encouraging students with challenges slightly out of their comfort zone in order for them to work on their problem solving skills and learn how to deal with struggle. To accomplish this effectively, they provided these challenges to students with the intention of not formally assessing them because they believe it would cause additional pressure, inhibiting their ability to succeed. Robert encouraged students at his school to become involved in extra-curricular programs in which they compete against other schools who may have more experience and greater ability. Robert explained,

We encourage kids to take extra curricular programs such as Lego robotics and solar car racing. They know they’re going up against other schools who are tech based. They know that these schools have more experience and everything like that. Some students with a fixed mindset are scared to face these schools. You have to alter the expectations. The expectation is not about winning, but rather the journey and participation.

Through these extra curricular programs, Robert fully understood that his students had a high possibility of being unsuccessful in the competition, but he really emphasized thinking about the process rather than simply the result. In a different manner, Joanne emphasized the value in extending thinking for students by providing additional challenges that are not for assessment purposes, but rather to induce problem solving and a sense of struggle for all learners. Joanne explained,
I tell them that the challenges are not being marked but it is only to help them stretch their thinking. This can give students more self-motivation and it really takes the pressure off of them while they are doing the activity. They know it is not being timed or marked so they know they have nothing to lose.

For both Joanne and Robert, providing students with opportunities to stretch their thinking without the pressure of feeling like they are evaluated is an important step towards increasing intrinsic motivation in which students are encouraged to learn for the purpose of improving their overall ability, and not to gain an external reward from success in the task. Dweck and Leggett (1988) distinguish between mastery learning goals – in which students exert effort in a task to accomplish self-pride and increase learning in a specific area – and performance goals – wherein students are motivated to gain favourable judgments of their confidence in the form of praise, recognition or high grades. It is suggested that students experience greater overall success and enjoyment in learning when they are motivated by intrinsic learning goals as opposed to performance goals (Dweck & Leggett, 1988). While it is not possible to allow all classroom tasks to be non-formally assessed, the conversation with the participants demonstrates that offering extra low-risk challenges both inside and outside of the classroom can be one way to increase this intrinsic motivation and risk-taking in the classroom.

4.5 Conclusion

All considered, this study found that educators are using a multitude of strategies and resources to fully understand how to effectively foster a growth mindset in their students. These strategies and resources include reflecting their understanding and belief about the malleability of intelligence and the importance of self-confidence to their students. Moreover, they include being mindful of different learning strategies and embracing individuality. These are
demonstrated in their methods of assessment and feedback that aim to promote individual progress and success with a growth mindset orientation. Lastly, the participants expressed their understanding and commitment to reshaping the way mistakes, challenges, and risk taking are viewed within their classroom environment. The key findings drawn from this analysis complement the existing research on growth mindset by providing anecdotal evidence of how this is used in practice, and the outcomes they observed. The prior research described earlier in Chapter Two provides a background of knowledge in the field, whereas the data derived from this study reflects some of what is already known while also adding additional insight to support the importance of growth mindset. The next chapter will discuss the implications of the current study, reflect on the significance of its use in practice, and provide recommendations for further research in the field.
Chapter 5: Implications

5.0 Introduction to the Chapter

In this chapter, I review the overall implications of the study and expand upon their significance in the field of education. I begin by examining the key findings of the main research question: “How is a sample of educators fostering a growth mindset in their students and what outcomes do they observe from their efforts?” Next, I discuss how the implications from the study are pertinent to my own professional identity and practice and the broader educational community as a whole. From here, I offer recommendations for teachers and educational professionals that may be considered when establishing a growth mindset in their classrooms and greater school communities. Finally, I conclude by briefly discussing some of the gaps that currently exist in growth mindset research while proposing areas for further investigation.

5.1 Overview of Key Findings and their Significance

The key findings that emerged from the study were categorized into four main themes that are significant to the implementation of growth mindset in the classroom. They are as follows:

1. The definition of a growth mindset was central to how the participants conceptualized intelligence and the role of self-confidence in students.

2. Personal definitions of intelligence shaped teaching and assessment strategies through the consideration of different learning styles and emphasizing individuality in the classroom.

3. Teachers assessed student performance through a growth mindset orientation by providing descriptive feedback and encouraging students to understand the value in continuous effort.
4. The role of challenges and learning from mistakes was viewed as an integral part of student growth which was demonstrated by changing the way failure is conceptualized within the classroom.

First, both participants’ personal definitions of growth mindset seemingly influenced their perceptions of students’ intelligence and was a factor in how they were able to create a growth-oriented classroom. The participants’ ability to develop a growth mindset classroom was reliant on their perception of intelligence as a malleable construct and through the belief that student learning is related to resiliency and positive response to critical feedback. In addition, the participants highlighted the idea that encouraging students to alter their language in a positive manner when speaking about themselves allowed them to be more confident and successful in their work. The importance of a teacher fully believing in a growth mindset and understanding it’s fundamental principles before instilling it in their classroom was an overarching theme throughout the interviews. In order to encourage students to adopt a growth mindset, it was stated that it is first reflected in a teacher’s pedagogical choices and behavior.

Throughout the interview process, it became clear that both participants understood that teaching with a growth mindset was related to recognizing that each student possesses their own unique skills and abilities. The participants brought attention to multiple intelligences which was supported through differentiation of instruction, in addition to the importance of developing critical thinking skills for all learners. Providing different opportunities for learning while maintaining a focus on critical thinking was suggested as an avenue for student creativity and individuality. Moreover, while both participants indicated that teaching how the brain and intelligence works is valuable for students in building a growth mindset, it was noted that there is a lack of available age-related resources related to brain science. On the whole, understanding...
human intelligence and how the brain learns was regarded as advantageous for establishing a growth mindset and emphasizing individual capacity.

Another theme that emerged from the study was the role of assessing student performance through a growth mindset lens, which was accomplished through the use of descriptive feedback and placing a greater emphasis on student process work and overall effort. Both participants alluded to their use of the Growing Success document which focuses on individual progression in assessment and found that to be a strong influence for implementing a growth mindset in their classroom and school community as a whole (Ministry of Education, 2010). Assessing students on their progression and rewarding their continuous effort can allow them to gain confidence and maintain persistence in their positive classroom behaviors and performance.

Finally, it was apparent that both participants perceived students’ challenges, mistakes, and failure as opportunities for learning and growth. Through the modelling of mistakes and reframing failure as a positive step leading to increased opportunities, both participants noted that their personal anecdotes of resiliency helped students persevere and keep a positive mindset even when they may have struggled. They both suggested this is important because students should know that not task will be completed quickly and easily, but that some tasks take more time problem-solving than others. Providing opportunities to for students to challenge themselves without the pressure of assessment was also noted as an important strategy for encouraging students to stretch their thinking. While it is important for students to experience success, encouraging challenges that are slightly too difficult can lead to more personal growth and progression if teachers create a safe space take risks.
5.2 Implications

In this section, I discuss some of the implications that emerged from the study along with the research examined in the literature review. First, I consider the implications this research on growth mindset has on the broader educational community— including teachers, administrators, and researchers. Next, I discuss how the findings impact my own professional identity and practice as a new beginning teacher.

5.2.1 The broader educational community

Research on the value and strategies for implementing a growth mindset, along with the data collected in the two interviews, can be utilized by the greater educational community to foster positive outcomes in student performance and behavior. First, teachers have the ability to create a classroom environment that uses a growth mindset approach by imbedding it in everyday pedagogy rather than just in a single lesson or assignment. By understanding how the brain works and what it truly means to have a growth mindset, teachers can act as the primary influence in a student choosing to think of their abilities and intelligence in a different way. Both participants spoke to the importance of how the language one uses can influence their thought and performance on a given task. Robert alluded to the use of positive self-talk in mathematics, and that anyone is able to be “a math person” if they believe they have the ability to do so. While it is ultimately the responsibility of the student to alter their mindset, the teacher does play imperative role in creating a growth-oriented classroom environment and being a positive role model for students to follow.

The findings are also pertinent to administrative staff, including principals, vice-principals, and superintendents who have the ability to create entire school communities and boards centered around growth mindset. School boards such as the Toronto District School
Board and Peel District School Board have already begun taking initiative to focus on growth mindset in the classroom, and it is likely that more boards will follow as well. The role of the administrative staff is to provide teachers with resources and professional development centered around growth mindset classrooms. As a principal who advocated the use of growth mindset in all classrooms, Robert argued that one of the biggest challenges is having teachers “buy in” to growth mindset. Although the reasons why teachers find it difficult to adopt a growth mindset are unknown, encouraging teachers to take part in professional development and using the available resources can have the potential to educate more teachers on growth mindset research. As the leaders in the school, administrators have the ability to create entire school communities that reflect their philosophies of teaching, learning, and personal growth.

While increasing the amount of professional development and resources for teachers can have the potential to increase the implementation of growth mindset classrooms across schools, participants spoke of the lack of teacher/student-friendly resources available. Researchers can play a role in the development of teacher and student-centered resources and lesson plans that are relatively easy for teachers to use. Brain science is often thought to be a complex process, but it is possible to simplify the language so that it is easier for both teachers and students to understand. Understanding how the brain grows like a muscle and makes new connections is one strategy that can lead to an increase of students adopting a growth mindset (Blackwell, Trzesniewski, & Dweck, 2007). Ultimately, researchers in the field have the ability to connect with educators by translating findings into evidence-based pedagogy that is user-friendly.

5.2.2 My professional identity and practice

As a beginning teacher with a background in psychology, I am confident that that my knowledge gained throughout this research will aid in my future practice. I have always
wondered why certain individuals are able to succeed in spite of failure or life challenges, while others are more likely to falter in the face of adversity. It is difficult to measure what truly makes an individual successful, but if there is one lesson learned from this research, it is that talent or intelligence alone cannot be the only factor determining an individual’s ability to succeed. Those who succeed and have the ability to achieve their own level of excellence do so because they believe that they can, even if it seems difficult or unlikely. In a time where problem solving and creativity are essential qualities in our society, I will take this mindset with me into my classroom and use it to help students realize their own potential and achieve their individual levels of success.

I believe that in order for students to believe in themselves and establish a growth mindset, they must first observe these same behaviors from their teacher. As such, I hope to model this behavior in every facet of my classroom from the way I communicate with others, how I push students to face challenges with a positive attitude, and how I provide students with real life examples of how developing a growth mindset can lead to great opportunities. Establishing a growth mindset is much more than putting posters up on a wall or telling students what it is – it must be practiced and imbedded throughout the year in hopes that students will adopt this philosophy and change the way they think outside of the classroom. The goal of a teacher should be to create the best possible opportunities for individual student success, and I am confident that implementing a growth mindset classroom can lead to higher levels of personal achievement.

5.3 Recommendations

In this section, I provide recommendations to various stakeholders that the research and could
potentially influence. These include recommendations to faculties of education, schools, and teachers.

5.3.1 Faculty of education

Specific to faculties of education in Ontario institutions, I believe it is necessary to equip new teachers with the knowledge of particular guidelines that aid in assessment. In Ontario, the Growing Success Document is a policy that strives to provide teachers with the means to assess student performance on an individual basis that promotes growth and progress (Ministry of Education, 2010). So often, teachers leave their basic training programs without a great sense of how to properly assess students, and they may end up reverting to the way they were assessed as a student. I recommend that all faculties of education in Ontario adequately equip teachers with the knowledge and tools for properly assessing students in this province by focusing on Growing Success. This includes proper training for assessing for, as, and of learning in ways that truly reflect an individual’s progress and effort. It is essential that teachers enter their career with the skills and resources needed to guide students in manner geared towards progress.

5.3.2 School boards

It has been made clear that a challenge facing teachers implementing growth mindset in their classroom is a result of a lack of preparation and/or knowledge on the subject matter. In order for teachers to begin teaching with a growth mindset focus, I recommend that school boards invest in more professional development for teachers along with practical resources for them to use. Providing books, websites, or any other materials on growth mindset and brain science can potentially be used by teachers who may not know or understand what it is or how to implement it in their classroom. As a whole, I believe that administration has the ability to
inform teachers on what growth mindset looks like, sounds like, and feels like so that they can use it to better their own development as well as their students.

5.3.3 Teachers

Teachers are arguably the greatest stakeholders that this research on growth mindset has the potential to influence. Teachers are ultimately responsible for deciding whether they wish to adopt a growth mindset and reflect it in their pedagogy. The first recommendation I have for teachers it to take the time to learn about growth mindset and think about how it can benefit their own lives. Once they experience the benefits of growth mindset first hand, I believe they will be more passionate in their teaching and their students will be more likely to alter the way they think about themselves and their abilities. Secondly, I recommend that teachers emphasize and celebrate individuality in the classroom through tasks that involve creativity and open-ended problems. Promoting creativity and open-ended problems can encourage students to take risks, illustrate their thinking, and be more engaged in what they are learning. The final recommendation I have for teachers is to consider student process work rather than simply their performance. By taking the time to thoroughly deconstruct student thought process, teachers can provide the descriptive oral and written feedback students need to make progress and grow their learning.

5.4 Areas for Further Research

Much of the research on growth mindset and its value in the classroom is relatively recent and the longitudinal outcomes students have experienced as a result of a growth mindset are not as prevalent. Although it would be difficult to objectively measure one’s mindset and how it correlates to future success, I believe that this could be achieved through measures such as case studies, surveys, and semi-structured interviews. It would be interesting to see which career paths
students take, whether they consider themselves successful according to their own standards and definitions, and understand how growth mindset has shaped their lives altogether. Although this type of anecdotal longitudinal research is difficult to quantify, I believe that stories and case studies of real life success can add value to this growing field of psychology and wellbeing in education.

In addition to the limited observed outcomes of a growth mindset over longer periods of time, another area lacking research is how growth mindset is related to performance and success in specific subject areas. Much of the current research that is subject specific focuses on the outcomes of students adopting a growth mindset particularly in mathematics (Boaler, 2013; Blackwell, Trzesniewski, & Dweck, 2007). On the other hand, more research into how growth mindset is related to subject areas such as literacy and sciences would be beneficial. I am curious as to whether there is a correlation between growth mindset and academic success across all subject areas, or if the effects are greater for certain areas of learning. With literacy being such a great focus across all school boards, especially in the early years, I believe that research could potentially provide teachers with new strategies for developing higher levels of reading and writing skills.

5.5 Concluding Comments

This research has allowed me to truly understand and appreciate the power a teacher can have on their students’ academic performance and overall wellbeing. Teachers have traditionally been regarded as an authoritative figure responsible for teaching curriculum content, but creating a successful environment for all students to excel can be a challenge. The ultimate goal of a teacher in the education system should be to guide their students in reaching their maximum level of individual success. Students come from different backgrounds, have had a wide variety
of experiences, and may be at different points in their learning and development. For these reasons, it is clear that there is not one universal method for teachers to make all of their students achieve to their highest levels. The research has demonstrated, however, that subtle changes in a teacher’s pedagogy and their philosophy of teaching and learning can have a tremendous impact on all students regardless of their abilities. By teachers adopting a growth mindset and reflecting it in their daily pedagogy, students can also begin to change their metacognition and self-perception which can result in greater confidence in all areas of learning. Keeping a positive frame of mind and approaching problems in a different light can be a powerful tool for students to tackle problems and learn something new about themselves. The hope is that with teachers instilling a growth mindset in their classrooms from the very outset, their students will be more engaged in learning for the intrinsic value it provides. We, as teachers, should want each student to come to class knowing that each day is a brand new slate with countless opportunities for growth. Teachers have the ability to make school a place where students look forward to learning and understand that everyone has the ability to reach great levels of success regardless of the barriers that may exist in their lives. I believe that through the implementation of a growth mindset, there is hope that all students will begin to think about themselves as life-long problem solvers, critical thinkers, and learners.
References


Appendix A: Letter of Consent for Interviews

Date: April 12, 2016

Dear ________________________,

My Name is Andrew Delost and I am a student in the Master of Teaching program at the Ontario Institute for Studies in Education at the University of Toronto (OISE/UT). A component of this degree program involves conducting a small-scale qualitative research study. My research will focus on learning what pedagogical strategies teachers use to implement a growth mindset in the classroom, and what outcomes they observe from their approach. I am interested in interviewing educators who have had a full time position for at least 5 years, are currently working in a primary/junior setting, and have demonstrated commitment to promoting a growth mindset in their classroom and community. I am looking to interview two teachers and one principal. I think that your knowledge and experience will provide insights into this topic.

Your participation in this research will involve one 45-60 minute interview, which will be transcribed and audio-recorded. I would be grateful if you would allow me to interview you at a place and time convenient for you, outside of school time. The contents of this interview will be used for my research project, which will include a final paper, as well as informal presentations to my classmates. I may also present my research findings via conference presentations and/or through publication. You will be assigned a pseudonym to maintain your anonymity and I will not use your name or any other content that might identify you in my written work, oral presentations, or publications. This information will remain confidential. Any information that identifies your school or students will also be excluded. The interview data will be stored on my password-protected computer and the only person who will have access to the research data will be my course instructor Dr. Angela MacDonald-Vemic. You are free to change your mind about your participation at any time, and to withdraw even after you have consented to participate. You may also choose to decline to answer any specific question during the interview. I will destroy the audio recording after the paper has been presented and/or published, which may take up to a maximum of five years after the data has been collected. There are no known risks to participation, and I will share a copy of the transcript with you shortly after the interview to ensure accuracy.
Please sign this consent form, if you agree to be interviewed. The second copy is for your records. I am very grateful for your participation.

Sincerely,

Name: Andrew Delost
Phone Number:
Email:

Course Instructor’s Name: Dr. Angela MacDonald-Vemic
Contact Info:

Consent Form
I acknowledge that the topic of this interview has been explained to me and that any questions that I have asked have been answered to my satisfaction. I understand that I can withdraw from this research study at any time without penalty.

I have read the letter provided to me by ____________ and agree to participate in an interview for the purposes described. I agree to have the interview audio-recorded.

Signature: ____________________________________________

Name: (printed) __________________________________________

Date: __________________________________________
Appendix B: Interview Protocol

Thank you for agreeing to participate in this research study, and for making time to be interviewed today. This research study aims to explore the strategies a small sample of educators use to implement a growth mindset in their classrooms, and to learn what outcomes they have observed from students. This interview will last approximately 45-60 minutes, and I will ask you a series of questions focused on relevant background information, your perspectives/beliefs about growth mindsets, your specific practices, the supports and challenges you have encountered, and any additional advice you have for new teachers. I want to remind you that you may refrain from answering any question, and you have the right to withdraw your participation from the study at any time. As I explained in the consent letter, this interview will be audio-recorded. Do you have any questions before we begin?

Section A: Background Information

1. How long have you been a full time teacher?
2. What grade and subjects do you currently teach? What grades have you previously taught?
3. Are you currently involved in any extra-curricular leadership roles within the school community?
4. Can you tell me more about the school that you teach in? (e.g. size, demographics, program priorities)
5. How did you develop an interest in the growth mindset? (e.g. personal, educational, professional experiences)
6. What learning opportunities have you experienced that prepared you for fostering a growth mindset through your teaching?

Section B: Teacher Perspectives/Beliefs

7. How do you define a growth mindset?
   a. What does this term mean to you?
   b. What are some characteristics or behaviours that a student with a growth mindset might display?

8. And what about a fixed mindset?
   a. How do you understand the meaning of this term?
   b. What are some characteristics and behaviors that a student with a fixed mindset might display?

9. From your perspective, which mindset is most commonly fostered in schools? Why do you think that is?
10. From your perspective, which mindset is most commonly exhibited by students? Why do you think that is?
11. In what ways do you think that a students’ mindset impacts their learning? In what ways do you think it impacts their well-being?
12. In your view, what are some of the key premises underlying the growth mindset?
13. What role, if any, do you believe mistakes and challenges play in learning?
14. What is the value in risk taking for learning?
15. In your experience, in what ways does praise for your students have an effect on their learning and motivation?

Section C: Teacher Practices

16. How do you foster a growth mindset in your students?
   a. If I were to spend a day in your classroom, how would I know that you are committed to fostering a growth mindset in students? What kinds of things would I hear and see?
   b. What are some of the key instructional approaches and strategies that you use to do this?
   c. Can you provide me with some specific examples of how you foster a growth mindset in students?
17. Do you ever teach students explicitly about the nature of intelligence and brain science research?
   i. If yes, can you please speak to how you went about teaching this and what was the response from your students?
   ii. If no, do you see any value in teaching about the brain to promote a growth mindset? And is this something you would consider in your practice? Why / why not?
18. How do students respond to your approach to teaching a growth mindset? What indicators of learning do you see from them?
   a. Have you noticed any positive outcomes in terms of increased effort, motivation, or interest in learning?
19. How, if at all, do you encourage students to face challenges and take risks, even when failure is a possibility? Can you relay some examples of how you have done this? What outcomes did you observe from students?
20. How do you maintain a growth mindset in a student who is struggling and is not seeing the academic results they desire?
21. In what ways do you think the strategies in which you praise your students and provide feedback promote effort as opposed to skill? Can you relay some examples to support this? What outcomes have you observed from students as a result of your approach to feedback?
22. How do you assess student performance through a growth mindset orientation?
   a. How do you assess students through this lens?
   b. How, if at all, do you assess students’ demonstration of a growth mindset?
23. What growth mindset strategies do you feel have the largest impact on students and why?
24. What strategies have you used to help a student who has developed a lack of motivation or learned helplessness, and what outcomes did you observe?
25. Some students, especially those that are gifted, may continuously show good academic performance but do so with minimal effort. How do you ensure that all of your students are being challenged and oriented towards personal growth?

Section D: Supports and Challenges

26. What challenges do you experience with fostering a growth mindset in students? How do you respond to these challenges?
27. In what ways do your students struggle to adopt a growth mindset? How do you respond to these struggles?
28. What factors and resources support you in your commitment to fostering a growth mindset in students? (e.g. school climate, supportive admin/leadership from admin, professional development resources, books, ted talks, videos, websites etc.)

Section E: Next Steps

29. What range of resources or supports from within the education system would further assist you in realizing your commitment to fostering a growth mindset in students?
30. What is some advice you would give to a new teacher who is interested in implementing a growth mindset in their classroom?

Thank you for your time and participation in this research study!