Teachers’ Attitudes and Practices on Differentiated Instruction

By

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Abstract

This study investigated teachers’ attitudes and practices differentiating instruction for elementary school-aged students. This study looked at where, when and how it is being implemented, and the benefits and challenges using it. The extant literature revealed that the various components that make up differentiated instruction are based on sound research; however, there is a lack of research supporting full implementation. This qualitative study used semi-structured interviews with two experienced elementary school teachers, while using the descriptive coding process to analyze the data. Four themes emerged: leveling the playing field, which discusses the importance creating an equitable teaching experience for all. The role of assessment. This theme details how the importance of assessment in differentiation as well as some useful strategies teachers can use. How teachers address students’ needs, which looks at the methods teachers can use to differentiate instruction for students. Finally, going above and beyond talks about the amount of time and effort needed to differentiate effectively. Each of these themes support the notion that there is considerable learner variance amongst learners, and appropriate modifications and accommodations that meet these specific needs benefit their learning. However, considerable time and effort is needed to make this a reality. Not meeting these needs is an issue of equity teaching from a one-size-fits-all method of teaching benefits a few, but not all, students. It is recommended that the Ministry of Education take ownership of these implications by providing adequate professional training for teachers and administrators and investing into new technologies that can support teachers to differentiate instruction appropriately.

Key Words: Differentiated instruction, learning environment, interests, levels of readiness, learning profiles, assessment
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Chapter One: Introduction

1.0 Research Context

According to the Achieving Excellence vision developed by the Ministry of Education, there are three core priorities to education: high levels of achievement, reduced gaps in student achievement, and increased public confidence in publicly funded education (Ministry of Education, 2014). Due to an increasingly diverse society, the Ontario government has put in place guidelines where all students, parents, and other members of the school community are welcome and respected (Ministry of Education, 2014). As a result, every student is supported and inspired to succeed in a culture of high expectations for learning (Ontario Ministry of Education, 2014). Each classroom is a microcosm of society at large, a small-scale representation of the society we live in. Our classrooms include students from different cultures, ethnicities, genders, gender identity, language, physical and intellectual ability, race, religion and socio-economic status. Each of these students have unique differences that can affect the way they learn. Given the high expectations for student achievement outlined by the government, and the fact that not all students are alike, it can be argued that educators need to provide effective instruction to meet the needs of all students regardless of their differences.

One strategy that could arguably meet this demand is differentiated instruction. Differentiated instruction is an approach to instruction designed to maximize growth by considering the needs of each student at his or her current stage of development and offering that student a learning experience that responds to his or her individual needs (Ministry of Education, 2010). More specifically, when teachers differentiate the content (what students learn), the process (how students learn), and the product (how students demonstrate their learning) per their individual interests, levels of readiness, learning styles and past experiences, then it becomes possible to foster high levels of academic achievement for all students (Tomlinson, 2000). Thus, it can potentially transform the classroom into a truly equitable environment for all learners.
1.2 Research Problem

In theory, differentiated instruction appears to be an effective teaching strategy. There are few educational strategies that carry the same sort of elegance and common sense understanding as differentiated instruction does (Tomlinson, 2000). However, therein lies its greatness—its a theory that lacks substantial empirical evidence to support its overall merits (Subban, 2006). Currently, most of the research that supports differentiated instruction has been produced separately; for example, there is substantial research that posits the importance of appealing to student interest when it comes to motivation (Linn-Cohen & Hertzog, 2007). Similarly, much research has been conducted to show that teaching per a student’s level of readiness provides the best learning experience possible (Grimes & Stevens, 2009). In addition, there has been much research that reveals the importance of learning profiles (learning styles, multiple intelligences, personality tests) when it comes to successful learning experiences (Woolfolk, Winne, & Perry, 2015). However, when it comes to empirically researched based evidence supporting the overall merits of differentiated instruction, there are few to speak of (Subban, 2006). To be clear, this gap in the research literature is a problem if educators are going to implement DI broadly.

1.2 Purpose of the Study

The Ontario government has set high expectations when it comes to education in this province; moreover, it sees a strategy that focuses on inclusion and equity as key to meeting those expectations (Ministry of Education, 2010). Differentiated instruction is a key strategy that can aid teachers in meeting this goal. However, there has been few research studies conducted to measure the overall merit of the practice from an empirical standpoint (Subban, 2006). The purpose of this study, then, was to find out how elementary school teachers are differentiating instruction for their students. It was also important to find out what teaching strategies are being used to effectively meet the demands of a diverse body of students because there appears to be a lack of evidence suggesting the strategy works.
1.3 Research Questions

The primary research question in my study is: what are teachers’ attitudes and practices on differentiating instruction with elementary students? To gain greater insight into this question, the following was also examined:

1. Where and when are teachers using differentiated instruction with elementary students?
2. How are teachers implementing differentiated instruction with their elementary students?
3. What are the benefits and challenges of using differentiated instruction with elementary students from a teacher’s perspective?

1.4 Background of the Researcher

My worldview has been shaped by several different factors that make up the lens that I see this research through. In terms of my philosophical beliefs, I believe that there are universal and objective truths that exist in the world. Perhaps, the reason I hold to such a view is due to my Christian upbringing. However, my epistemological beliefs do not follow from my ontological ones, especially when it comes to education. I am a strong believer in constructivism—a view which espouses that knowledge is constructed through our experiences (Confrey, 1990). As a result, truth and knowledge can’t be external and objective truths, because they are constructed within the realm of human experience. Unfortunately, I have yet to find an adequate resolution for these seemingly contrasting views, but I do skew heavily towards my constructivists beliefs when it comes to education. For example, I believe that our students come to the classroom with a wide range of unique characteristics that have been influenced by a wide range of social and intellectual factors. Consequently, my job as an educator, is to ensure that I tailor my instruction according to the unique and individual needs each of these students bring to the classroom. It is my aim to form my instruction to suit who my students already are. This, to be clear, is a very
student-centered approach and one that fits nicely with a constructivist worldview. Consequently, my biases, during this research, will heavily sway towards accepting differentiated instruction, because many of its foundational elements are grounded in a constructivist approach.

I also have a very personal stake in this research as both my wife and son have learning disabilities. My wife struggled in school for years not knowing that she had special needs that were never addressed. In fact, she didn’t find out about her learning disability until she was in college. Thus, she was treated with a one-size-fits-all approach and perceived as “not smart enough” when she was unable to complete her work. All that she needed, in retrospect, was some simple modifications to meet her specific learning needs. While everything turned out well for her at the end of the day, I can imagine how much better her educational experience could have been if her needs were addressed at an earlier age. Thankfully, schools are more aware of these issues today—as is evident in the fact that my son was diagnosed early. However, much work still needs to be done. Learning disabilities fall on the more extreme side of the spectrum and are hence taken very seriously today; however, that does not mean that differentiation should be isolated to such instances. Since all students come to the classroom with a variety of differences, they can all benefit from some instructional accommodations that will enrich their learning experiences. If the goal of a teacher is to help each of his or her students develop to the best of their academic abilities, then we must differentiate. Given my philosophical, theoretical, and personal perspectives, I fear that my position, in relation to my participants and the literature review, will heavily favour the opinions that support differentiated instruction. Thus, I will try my best to limit such biases considering this reality.

1.5 Overview of the Study

This basic structure of this research paper is divided into five main chapters. The first chapter is the introduction where I discuss the context of the research, its purpose, the questions that drive the study, my background and positionality in relation to the study, and, finally, an
overview of the entire paper. The second chapter includes a literature review that critically discusses the research that has been conducted on differentiated instruction to date. It details the theoretical framework of differentiated instruction, research that supports the individual parts of differentiated instruction, research that supports the holistic merits of differentiated instruction and the criticisms leveled against the practice. The third chapter describes the methodology used to conduct the research study. More specifically, it details the research approach and procedures, the instruments of data collection, the participants (sampling criteria, recruitment procedures, and participant biographies), data analysis, ethical review procedures and the limitations and strengths of the process. The 4th chapter looks at the research findings. I will report on what I found and learned from the research as well as its significance to education. Finally, chapter 5 will conclude the paper by discussing the implications of these findings, provide recommendations for the field of education, highlight further areas of research that were identified during the study, and conclude with comments detailing why the research matters.
Chapter 2: Literature Review

2.0 Chapter Introduction

Today’s classroom is teeming with diversity. Students from all walks of life enter the classroom with a plethora of differences shaped by many factors; they vary in culture, ethnicity, socio-economic status, gender, sexuality, interests, level of readiness, multiple intelligences, and learner style, and preference. As a guiding principle, educators seek to ensure that all their students are successful. For this to be met effectively, teachers must equitably tailor their instruction so that each student is getting the necessary skills to grow academically. Thus, educators are challenged to differentiate their instruction in ways that meet the needs of each of their students. According to Tomlinson (2000b):

At its most basic level, differentiation consists of the efforts of teachers to respond to variance among learners in the classroom. Whenever a teacher reaches out to an individual or small group to vary his or her teaching in order to create the best learning experience possible, that teacher is differentiating instruction. (pg. 1)

That is, teachers practicing differentiation will modify and adapt their instruction in ways that will help create the best possible learning experience for each student. While the merits of differentiated instruction are worth pursuing, it can be considered challenging. According to Holloway (2000), even teachers who have been trained in differentiated instruction are finding it difficult to implement in their own classrooms. This leads to the main problem of this study, how reasonable is it for a teacher to effectively differentiate his or her instruction within the classroom? In this literature review, I will focus on surveying all the relevant literature to determine what is known about differentiated instruction. First, I will discuss the conceptual framework of differentiated instruction by focusing on three issues in learning, namely, brain research, learning profiles (learning styles, preferences, and intelligences), and Vygotsky’s (date) zone of proximal development. Next, I will look at the mechanics of differentiation by discussing the four core components of instruction that need to be modified, the tools used to accomplish
this, and the relevant research that supports them. After examining the mechanics, I will discuss how the strategy is being implemented within the classroom, and the criticisms levied against differentiation. Hopefully, through this research, I will be able to determine whether differentiated instruction is a viable teaching practice that can meet the needs of a diverse population of learners. Moreover, I hope to gain valuable insights into effective teaching practices that can be used in the classroom.

2.1 Conceptual Framework

Differentiated instruction is rooted in a combination of learning developments that took place through developments in brain research, learning styles, and the constructivist learning theory (Anderson, 2007).

2.1.1 Brain Research

We now have a better understanding of how the brain works when it comes to learning. For example, we understand that the brain is uniquely organized (Sousa & Tomlinson, 2011). While there are basic similarities in how we all learn, there are important differences that have an influence on learning. Such differences include our interests, levels of readiness, and learning styles. Consequently, this means that we have distinct preferences for how we learn (Sousa & Tomlinson, 2011), that emotional processes in the brain's limbic system contribute to learning. For example, the brain overproduces adrenalin when a student feels unsafe or intimidated, which causes the child to focus on self-protection rather than learning (Tomlinson & Kalbfleisch, 1998). Students must engage in appropriate challenges to learn effectively. If the challenge is beyond their level of readiness, then the brain overproduces key neurotransmitters that impede learning; conversely, if the challenge is below their level of readiness, the brain will not engage or respond by releasing the necessary chemicals for optimal learning (Tomlinson & Kalbfleisch).

2.1.2 Learning Profiles

Brain research has shown that our brains are developed with important differences that have an influence on the way we learn (ref), which means that each student learns differently.
Much work has been done to support this notion; for example, in the late 1960s, Dr. Rita and Kenneth Dunn realized that humans are equipped with different learning styles. According to Dunn, Beaudry and Klavas (2002), “Learning style is a biologically and developmentally imposed set of personal characteristics that make the same teaching method effective for some and ineffective for others” (pg. 75). Previously, Barbe and Milone (1981) had proposed that humans learn through three distinct learning modalities: visual, auditory, and kinesthetic. Adding to this, Gardner (1983) argued that humans are fashioned with multiple intelligences that have an influence on the way we learn, proposing that there are at least eight separate intelligences that are realized in a greater or lesser extent in each human being. Finally, research on how the personality effects learning has also contributed to this theory as well. For example, the Myers-Briggs Type Indicator based on the work of Carl Jung, specifies four cognitive learning styles (extraversion, sensing, thinking, and judging) that influence the way one learns (Salter, Evans, & Forney, 2006). All in all, these research studies have demonstrated that not all human beings learn the same, and therefore suggest than students would benefit from instruction tailored towards their specific learning style, modality or intelligence.

2.1.3 The Zone of Proximal Development.

Vygotsky’s (1978) sociocultural theory of learning proposed that social interaction is fundamental to cognition; perhaps his greatest contribution to the field of learning was his notion of the zone of proximal development (ZPD). According to Vygotsky, the ZPD is been defined as,

The distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined by independent problem solving and the level of potential development as determined though problem solving under adult guidance, or in collaboration with more capable peers. (p. 86)

In other words, our ability to learn is determined by our level of readiness and the guidance of a teacher or more capable peer. As seen earlier, recent developments in brain
research has also verified this notion as the brain tends to shutdown when tasks seem to difficult to manage (Tomlinson & Kalbfleisch, 1998). When we take these areas of development into consideration, differentiated instruction is clearly based on sound theoretical principles and research that demonstrate a need for each learner to be instructed in specific ways. We must now look at how this conceptual footing is applied within a classroom.

2.2 The Mechanics of Differentiated Instruction

This section will discuss the how differentiated instruction works in theory by looking at the main components teachers can differentiate as well as the tools used to differentiate them.

2.2.1 Content, Process, Product

Carol Ann Tomlinson is perhaps the world’s leading authority on the subject of differentiated instruction; she has written a plethora of material on the subject and is cited in almost all literature that refers to it (refs for her here). Tomlinson identifies four main components that teachers can differentiate: content, process, product, and learning environment (Tomlinson, 1999). Content refers to what the students learn and the materials or mechanisms through which learning is accomplished (Tomlinson, 1999). Process refers to the activities in which students engage to make sense or master the content (Tomlinson & Allan, 2000a). As noted by Tomlinson & Allan (2000a), “a teacher can differentiate an activity or process, for example, providing varied options at differing levels of difficulty or based on differing student interests” (pg. 8). The product is the culminating task or project, which asks the student to rehearse, apply, or extend what he or she has learned in the unit (Tomlinson, 2000). A teacher can differentiate the product by allowing students to demonstrate their understanding through a variety of ways. Students can demonstrate learning through portfolios, puppet shows, murals, either done individually or through group presentations (Tomlinson & Allan, 2000a; Tomlinson, 2000b). Finally, the learning environment refers to the way the classroom works or feels (Tomlinson, 1999). Teachers can differentiate
learning environments by creating space that facilitates both individual and collaborative learning, materials that reflect a variety of cultures and home settings, and clear guidelines to help students advocate for their own learning (Tomlinson, 2000b). In a way, each of these four components represent the categories of instruction. That is, each lesson will always have content to be taught, processes to practice the content, and products to demonstrate whether the student has grasped the content. Where differentiation truly makes its mark, however, is via the tools that are used to manipulate each of these categories.

2.2.2 Interests, Readiness, Learning Profiles

According to Tomlinson and Kalbfleisch (1998), differentiated classrooms are “responsive to students’ varying readiness levels, varying interests, and varying learning profiles” (p. 54). Essentially, the tools used to differentiate are based on the varying characteristics that each student displays. Tomlinson (2000a) discusses many strategies teachers can use to differentiate instruction according to these characteristics. For example, she recommends that a teacher might construct tasks or provide learning choices at different levels of difficulty as a response to students’ readiness levels. Or perhaps a teacher might decide to give his or her students the ability to choose a topic of exploration to capture their interest and motivation. Finally, she notes that a student’s learning profile might be differentiated by presenting information through auditory, visual, and kinesthetic modes. While there is a lack of research demonstrating how effective differentiated instruction is, there is a wealth of theory and research that supports differentiation in the areas of levels of readiness (ZPD), interest, and learning profiles (Tomlinson, Brighton, Holly, Hertberg, Callahan, Moon, Brimijoin, Conover, & Reynolds, 2003).

Research on Interests. Student interest is a key component of differentiation and can be used as an effective tool to support learning in the classroom (Tomlinson, 2001). Tomlinson suggests that student interests is a powerful motivator, which wise teachers could take advantage of in a differentiated classroom (Tomlinson, 2001). When instruction is adapted to the interests of students’ it tends to enhance motivation, productivity, and achievement (Tomlinson et al.,
For example, in a 13 month qualitative study of two self-contained gifted classes, students were given considerable choice in what they wanted to learn. As a result, it was reported that students’ ownership of their learning experiences seemed to intrinsically motivate their learning experiences (Linn-Cohen & Hertzog, 2007). Similarly, Tuan, Chin, Tsai, and Cheng (2005) conducted a 10 week qualitative and quantitative study on the effectiveness of inquiry based teaching on student motivation. After examining 486 students who participated in 40 hours of inquiry-based learning over the research period, they determined that inquiry instruction not only enhanced student learning in science, but also motivated them towards science learning on a whole. Thus, an inquiry-based approach to learning seemed to peak student interest leading to increased motivation to learn—a central tenant of differentiated instruction. Using a sample of 1095 students, Abrantes, Seabra, and Lages (2007) looked at what elements informed students’ perceived learning. Using questionnaires filled out by students, they found that student interest was the primary influence on their perceived learning. When we look at the sum of each of these studies in a collective, it would appear as if student interest is a key contributor to student learning. When linked with differentiated instruction, teachers can arguably use student interest to adapt the content, process, and product of their instruction making students more engaged in the learning process.

**Research on Readiness.** As touched on earlier, a student’s level of readiness is an important component to effective learning. We have already seen that Vygotsky’s ZPD and recent findings in brain research both support the notion that students learn best when given appropriate challenges (Vgotsky, 1978; Tomlinson and Kalbfleisch, 1998). As Byrne (1996) notes:

> Instruction should always “be in advance” of a child’s current level of mastery. That is, teachers should teach within a child’s zone of proximal development. If material is presented at or below the mastery level, there will be no growth. If presented well above the zone, children will be confused and frustrated (p.33)
This notion was also supported by Linn-Cohen & Hertzog (2007) as they discovered that gifted students responded positively when given a more academically challenging curriculum. In an action research study that looked at 22 students receiving math instruction in a 4th grade classroom, Grimes and Stevens (2009) looked at how the use of self-assessment could enhance student learning. For example, if the students felt they mastered a math problem—and if this was verified by the teacher—they were encouraged to move on to a more challenging one. If not, they were given more support until they achieved mastery. Consequently, the data—at the end of the research period—showed that both low and high achieving students’ academic performance in math instruction increased (Grimes & Stevens, 2009). Each of these findings support both the theory and research on the issue of student readiness. This furthers the notion that the parts that make up the whole of differentiated instruction is supported by a wealth of study.

Research on Learning Profiles. As discussed earlier, one of the key elements in the conceptual framework of differentiated instruction is learning style theory. Many theorists throughout the last century, as discussed earlier, have confirmed the notion that we are equipped with learning. Per Tomlinson, the term learning profile refers to a student’s preferred mode of learning that can be affected by several factors, including learning style, intelligence, preference, gender, and culture (Tomlinson, 2003). In relation to learning preference, Sternberg (date) proposed three modes of thinking: analytical, practical, or creative. As individuals, we tend to lean more heavily towards one out of the three modes when it comes to learning (Tomlinson et al., 2003). In a study that looked at how teaching triarchically improves school achievement, Sternberg, Torff, and Grigorenko (1998) looked at 213 third-grade students in two elementary schools in Raleigh, North Carolina. After determining the cognitive abilities of the participant students and extensively training the teachers to teach according to the triarchial model, students received instruction that reflected the differences between the three strategies. When comparing the results of the students who received triarchic instruction to those who received more traditional means, the researchers concluded that the former generally learned more than the
latter. As an implication, learning profiles, much like student interest, can be used to modify the content, process, and product of instruction as it molds learning towards their strengths.

Like the conclusions drawn from the research pertaining to both interests and readiness, a case can certainly be made that students respond positively to instruction when it is catered towards their learning profiles. In consideration of the literature, it would appear that the elements of differentiated instruction do, in fact, influence student learning positively. However, so far, we have only looked at each of these elements in isolation. As it stands, we need to address whether these elements can work together to form an effective differentiated classroom. To be clear, we will be looking at two studies—amongst others-- referred to earlier. However, instead of looking at the individual aspects of each study, we will now look at them in their entirety.

2.3 Full Implementation

Grimes and Stevens (2009) found success in their implementation of DI by focusing on five aspects of differentiation for math instruction: student readiness, flexible grouping, student responsibility, peer tutoring, and modified instruction. The study lasted for a year and yielded positive results. Students who traditionally scored low on math assessments scored as well as their high performing peers, motivation jumped amongst all students, and students were more engaged in the learning process. Low achieving students recorded a 91% increase and displayed a considerably more positive attitude when it came to their feelings on math instruction. Equally, high achieving students recorded an 11% increase on overall performance and their motivation increased as well (Grimes & Stevens, 2009). It is clear from the research that the ongoing assessment of students’ levels of readiness in this class helped improve student learning. Students were arguably able to self-assess their own learning and set their own goals for improvement. Moreover, this data also helped the teacher understand where the students were in terms of their readiness and, thus, tailored the content to meet their needs (Grimes & Stevens, 2009).
Linn-Cohen and Hertzog (2007) conducted a 13 month study to see how teachers used differentiation strategies to challenge fourth and fifth grade gifted students in contained classrooms. In contrast to Grimes & Stevens’ (2009) research, the teachers differentiated instruction across a range of subjects including, math, science, social studies, and language arts. Moreover, each teacher was given freedom to develop their own curriculum in order to challenge their students. Students were given substantial choice when it came to learning, which led to increased motivation. In addition, the students were exposed to deep connections between what they learned in school and the real world. This led to lessons that had a sense of purpose and authenticity. As the year progressed, the teachers moved from a homogeneous model of instruction to more individualized one. This gave them the ability to meet each student’s own interests, readiness, and academic strengths. Finally, the self-contained classroom provided an environment of high-expectations that gave the students an increased sense of satisfaction. In the end, the study concluded that each of the students positively benefited from the instructional changes, and the study shone a brighter light on how teachers can effectively differentiate instruction if given greater autonomy (Linn-Cohen & Hertzog, 2007).

Stravroula, Leonidas, and Mary (2011) looked at the application of differentiated instruction in 24 elementary mixed ability classes. In order to determine the effectiveness of DI, they compared the results of the group that received the instruction with the group that did not. In the end, they determined that the practice of differentiation in mixed ability classes did in fact improve student learning; however, they did note that training and support for teachers was critical to successful implementation.

Lastly, in a study conducted by Robert Smit and Winfried Humpert (2012), they looked at a school improvement project that involved 162 teachers and 1,180 students to obtain an overview of the types of differentiated instruction that were currently being practiced. In their findings, they found that teachers demonstrated differences in practices, that team collaboration enhanced teachers’ use of the strategy, and perhaps most importantly, that there were no positive results showing student achievement (Smit & Humpert, 2012). This is troubling as it shows that
there is no universal agreement in terms of the effectiveness of differentiated instruction when it comes to student learning.

Much of the research we just looked at suggests that differentiation can, in fact, work effectively as a whole package. The one common component that seemed to make a substantial impact on the effectiveness of DI was the role of the teacher. In each of the studies, save the last, the teachers seemed to understand what differentiation was, how to do it, and were given the freedom to be flexible within their classrooms.

2.4 Criticisms

Much of the research reviewed in this chapter suggests that differentiation can, in fact, work effectively as a whole, however, there remains a noticeable gap between theory and empirical evidence to fully support it. Some would even argue that there is little to no empirical evidence that directly supports the merits of differentiated instruction package (Subban, 2006). Hall, Strangman, and Meyer (2003) also agree that there is a decided gap in the literature and stress that further research is warranted. Additionally, the strategy is seen as one that is difficult to implement (Holloway, 2000). While these criticisms are valid, many suggest that the limitations of the strategy are due to limited and ineffective implementation (Stradling & Saunders, 1993). In addition, many modifications that are made are likely to be improvisational or reactive, rather than pre-planned or proactive (Tomlinson, 2003).

2.5 Chapter Conclusion

In the end, this literature reviews uncovers three major revelations: first, the various components that make up differentiated instruction are firmly based on many research theories. It has a strong conceptual framework, and each of the strategic tools it employs (interests, level of readiness, and learning styles) to modify the content, process, and product of a learning experience is supported by a strong foundation of research. Second, although there is much research to support the parts that make up differentiated instruction, there is a lack of empirical based research to prove it works as a teaching strategy. Thus, the gap in the research is clear—
there needs to be less emphasis at this point on the theoretical virtues of differentiated
instruction, and more empirical research done to track how to effectively implement it in within
the actual classroom. Perhaps one way to begin filling this gap is by looking at the attitudes and
practices of teachers when it comes to differentiating instruction; my study aims to begin to fill
this gap by…. As the research has shown, teachers play a vital role in making effective
differentiation a reality. By uncovering what works and what does not, perhaps a strong body of
effective strategies and practices can be developed to aid in this practice.
Chapter Three: Research Methodology

3.0 Introduction

Chapter Three focuses on the research methodology that used to conduct this study. I will begin by articulating the research approach and procedures as well as the instruments used to collect the data. From there, I will address the process involved in regards to the participants of the study. This includes the sampling criteria, procedures, and participant biographies. Next, I will discuss how the data would be analyzed and reviewed the ethical procedures considered for the study. Finally, I will identify and discuss both the methodological limitations and strengths of the research study before ending with a brief overview and preview of what comes next.

3.1 Research Approach & Procedures

To gain a complex and detailed understanding of the topic, a qualitative research methodology consisting of a literature review and semi-structured interviews with teachers was employed. In the handbook of qualitative research Denzin and Lincoln (2005) note, “qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring them” (p. 3).

Since my main research question aims to unravel teachers’ attitudes and practices in regards to differentiating instruction with elementary students, a qualitative approach seemed like the most appropriate method available. While my study will not involve observing the participants in their natural settings, it will, however, seek to make sense of, or interpret, the meanings that teachers ascribe to the practice of differentiating instruction with elementary students.

3.2 Instruments of Data Collection

To collect the data for this research, I used a semi-structured interview method. While I had the choice to use a structured or unstructured interview method, I found that a happy balance between both better aligned with my research goals. The structured interview approach is
commonly used for quantitative based research (Edwards & Holland, 2013). Conducting surveys, for example, is representative of a structured based interview. Surveys are often based on a questionnaire that follows a sequence of questions (Edwards & Holland, ). Moreover, the questions are likely to be asked in the same order and same manner for all participants of the research (Edwards & Holland). Essentially, it follows a rigid set of parameters leaving little room for flexibility. Clearly, this method of data collection would not be appropriate for qualitative research.

On the other side of the spectrum, we have the unstructured approach. Unlike the former, the unstructured approach is frequently used with qualitative research. Per Edwards & Holland (2013), the unstructured approach, “allows the interviewee to talk from their own perspective using their own frame of reference and ideas and meanings that are familiar to them” (p. 30). Consequently, this method is flexible in nature as the interviewee is given a considerable amount of latitude when answering questions. This works well if the researcher is open to new developments that could potentially alter the direction of the research project. On the other hand, it would be quite difficult to compare the results of interviews that are too unique from each other.

Finally, the semi-structured interview method combines the characteristics of both the structured and unstructured method into one medium. This method works well as the researcher can develop a list of questions or a series of topics they want to cover in an interview to maintain some level of consistency (Edwards & Holland, 2013). Moreover, it also offers flexibility in how and when the questions are positioned and how the interviewee can respond. Essentially, this type of interview allows more space for interviewees to answer questions on their own terms, but also provides some structure that can be useful for comparisons amongst other interviewees (Edwards & Holland, 2013). As I will be interviewing two elementary teacher participants from different schools, the semi-structured approach will allow me to gain rich insights due to the flexibility of the interview process, but also allow me to compare the data in a structured and meaningful context.
3.3 Participants

In this section I interviewed two primary school teachers to explore their attitudes and practices pertaining to differentiating instruction for elementary students. I will discuss the sampling criteria used to determine how I will choose each participant, detail the sampling procedures, and provide participant biographies for each candidate.

3.3.1 Sampling Criteria.

In terms of sampling criteria, there were a few conditions I used to gauge how I selected each participant. First, I looked for a range of teacher experience. I selected a teacher in the middle of his or her career (10 years), and a teacher with 17 years of experience. With such a range, I could gain insights into how experienced teachers approached differentiated instruction. For example, I was able to determine whether the attitude of a teacher with 10 years or more experience aligned with that of a teacher with 17 years of experience. I also gained some insight, although limited in scope, as to whether teachers in the middle of their careers incorporated more differentiated strategies in their lessons than more experienced teachers? And if so, was this due in part to the focus and training received at current teacher education programs?

Second, I also looked for participants who had experience teaching a range of subjects and grades. This helped me gain insights into whether teachers’ attitudes and practices, when it came to differentiated instruction, was influenced by grade level and subject. For example, perhaps a strategy that worked well with primary students did not work well with junior students, or one that worked well with math instruction did not with literacy.

Third, I also looked for candidates that demonstrated some expertise in regards to differentiated instruction. Did the candidate conduct workshops about differentiated instruction? Was the teacher part of a schoolwide initiative that encouraged DI? Or was the participant specially trained in differentiated instruction? Finally, I also sought out participants that had experience in special education. These individuals have been specially trained to deal with students with special needs and, thus, brought out much in regards to the topic at hand.
3.3.2 Sampling Procedures.

To recruit participants for my study, I relied heavily upon convenience sampling. Convenience sampling is a technique involving the selection of the most accessible subjects. Moreover, it is less costly to the researcher in terms of time, effort, and money (Marshal, 1996). I chose this procedure mainly because of my association with many teachers that are easily accessible. These include, teacher mentors from practicum, as well as teachers from my children’s schools. As I have relationships with some these teachers, it was easier for me to gain commitments from them for the interviews. To be clear, I ensured that interviews with past teacher mentors were conducted after my practicums to eliminate any possible bias in the data. Moreover, I ensured that none of the interviewees were teaching any of my children at the time of the interview.

3.3.3 Participant Biographies.

Both participants in this study are teachers employed by the Ontario Public School system. Each has been teaching for over 9 years bringing a wealth of experience to the discussion on differentiated instruction. The participants well remain anonymous through pseudonyms.

John

John is currently a grade three teacher in his ninth year of teaching. Throughout his career he has taught music, ISSP, and spent six years as a kindergarten teacher before transitioning into the primary grades. He has not taken any professional development course on diversity and inclusive education, but he has attended various workshops pertaining to differentiating instruction.

Jeff

Jeff is currently the lead for school support and technology at an elementary school. However, he has taught grades 9, 10, 12, and OAC at the secondary level; 6, 7, and 8 at middle school level; and grade 5 at the elementary level. In terms of professional development on diversity and inclusive education, Jeff has taken a course on the” Future We Want,” a program
encouraging cultural inclusiveness within the Public-School System. He also facilitated and taught the course for two years thereafter. He was worked with teacher college faculty members through an advisory program to present character education, and infusing diversity and equity within the curriculum. He has also attended ETFO training and general staff means in regards to inclusive education as well. In addition, he was the school success lead for differentiated instruction for 7-8 year. Within this time, attended several workshops and, in turn, presented to staff.

3.4 Data Analysis

The process of data analysis, according to Creswell (2013), “involves organizing the data, conducting a preliminary read-through of the database, coding and organizing themes, representing the data, and forming an interpretation of them” (p. 179). This was, perhaps, one of the most challenging aspects of this research paper as it required a lot of time, focus, and energy. I began my analysis by transcribing the interviews with great detail. Following in the steps suggested by Creswell, I read the transcripts in their entirety several times in order to get a sense of the whole before breaking it into parts. Furthermore, I jotted down short phrases, ideas, or key concepts in the margins in order to help identify major ideas or themes that were present. After gaining a sense of the big picture, I began to code the transcripts into smaller parts. During this step in the process, I began to filter out information that was irrelevant to the research by creating a short list of codes for the information. Moving on, any codes that seemed to share common characteristics were strung together to represent larger families or themes. At this point in the analysis process, I was finally able to take the themes generated by the codes and construct a larger meaning out of the data. These larger themes will be discussed in much more detail in chapter 4 of this research paper.

3.5 Ethical Review Procedures

During the research process, it was important to consider all the ethical issues that could have possibly arisen at all stages of the study and how they could be addressed (Creswell 2013).
To meet this demand, I took great care in following all the ethical guidelines put forth in the Masters of Teaching program at OISE. Moreover, participants were given the right to feel safe and secure during the interview process so to minimize potential harm. In order to create this level of safety for my participants, I put in place a number of ethical practices. First and foremost, all participants were assured that the information given would be treated with the strictest sense of anonymity and privacy. I accomplished this in two ways: first, the participants were given pseudonyms (i.e. participant A) to protect their identities; and, second, great care was taken to minimize any potential inferences that could have led to the unmasking of their identities. In addition, the participants were given the right to withdraw their contributions to the study at any point during the research process. Each participant was also fully briefed about the nature and scope of the study. They were informed of the purpose of the study, the process by which it was going to be conducted, and my intentions in regards to the implications of the study. Each participant was also provided with my email address and phone number should any questions or concerns arose throughout the study. A copy of the interview questions (see Appendix B) and consent letter (see Appendix A) was also given to the participants well ahead of the interview time. It was important that participants be given the opportunity to review the questions beforehand so they could refrain from answering any questions that might have made them feel uncomfortable. In addition, if they had any second thoughts considering the questions provided, they would have the opportunity to withdraw from the study completely. Participants were also invited to review the transcripts, once transcribed, to vet any possible responses or statements provided. Furthermore, the right to retract any statements before the data analysis stage was given without question. In terms of the data, all the audio recordings were stored on a password protected device and a computer (for backup purposes), and would be destroyed after 5 years. Finally, participants were provided with a consent letter to be signed. This letter sought the consent of the participants to be interviewed as well as recorded via audio. In addition, it provided a brief overview of the study, ethical considerations, and expectations of participation.
3.6 Methodological Limitations and Strengths

When dealing with the limitations of this study, the primary concern centered on the ethical parameters of the MTRP. Namely, the fact that only teachers could be interviewed. Accordingly, parents, students, classroom observations, surveys and other useful sources of data were strictly prohibited. Consequently, this limited the variety of data that could have been collected during the research period. As Creswell (2013) notes, “Qualitative researchers typically gather multiple forms of data, such as interviews, observations, and documents, rather than rely on a single data source” (p. 45). Since good qualitative research typically employs rigorous data collection procedures to gain greater insights about the topic, only a small portion of the greater picture was possible to unravel. In addition, the sample pool of teachers was quite limited as well. Given the fact that only two to three teachers were interviewed greatly diminished the veracity of the conclusions that were drawn. More specifically, broad and sweeping generalizations that might been useful to others in the field, were not possible to make. This was particularly damaging as there was a need to find useful strategies to address the growing diversity found within classrooms today.

As far as the methodological strengths were concerned, having teacher participants provide useful data from those who are on the frontlines of education day to day was a strength of this research. Given the gaps in research when it came to differentiated instruction (lack of empirical evidence to validate its merits), being able to speak with elementary teachers about their attitudes and practices in relation to differentiated instruction provided great insights that reached beyond the realm of theory. Moreover, with a semi-structured interview process, each participant was given the space to elaborate and expand on their perspectives. According to Creswell (2013), “researchers keep a focus on learning the meaning that the participants hold about the problem or issue, not the meaning that researchers bring to the research or writers from the literature” (p. 47). Consequently, the methodological process used in this study directly addressed the main purpose of this study; namely, discovering the perspectives that teachers hold when it came to using differentiated instruction with their elementary students.
3.7 Chapter Conclusion

In conclusion, this chapter described, in much detail, the rigorous research methodology employed during this study. The chapter began by discussing the research approach and procedures highlighting the use of a literature review, semi-structured interview methods and the appropriateness of using the qualitative method. Next, I elaborated on the purpose and benefits of utilizing a semi-structure interview process as the instrument for my data collection. I also discussed the participants that were selected for this study. This included the criteria I used to filter each candidate, the practical benefits of using convenience sampling to find them, and their personal biographies. The next section, data analysis, went into some detail on how the data will be analyzed. This section made mention of the significance of data analysis and explained how the coding practice led to the unravelling of common themes and divergences in the data. Reviewing the ethical procedures of the study was also important as it dealt with issues of confidentiality, privacy, safety and consent. This chapter also focused on the methodological limitations and strengths of the study. For instance, the main limitation revolved around the narrow scope of the ethical parameters of the MTRP, while the strengths highlighted the fact that participant meaning aligned nicely with the purpose of the research study. In terms of next steps, chapter 4 will take a closer look at the research findings. This will include a throughout discussion of the findings, connections drawn between the findings and the literature review, and key learnings.
Chapter Four: Research Findings and Analysis

4.0 Chapter Introduction

Upon completion of the data collection outlined in chapter three, there were many commonalities that became plain. As discussed in the literature review, differentiated instruction is a framework for instruction that is based on many different teaching theories and strategies that are individually supported by research. However, when it comes to empirical research-based evidence supporting the use of differentiated instruction, there are few to speak of (Subban, 2006). As a result, these findings provide insight as to how teachers perceive and practice differentiated instruction. To organize the data, the descriptive coding method was used to summarize and categorize common topics found within the data. Both participants are elementary teachers that have experience ranging from 10 to 17 years of teaching. Thus, both brought a wealth of experience to the interviews describing what types of strategies they have used and whether they were and still are effective. In this section, there will be a thorough description of the findings by theme and accompanying sub-themes. This will contain a discussion on the key findings including references to the participants’ practical and instructional strategies and quotations to support these results. Each of these themes were developed with the primary research question in focus: What are teachers’ attitudes and practices on differentiating instruction with elementary students? With this in mind, the data was, then, organized into four central themes:

1. Leveling the playing field.
2. Assessment.
3. How teachers address students’ needs.
4. Going above and beyond.

Following a detailed discussion of the findings, connections to the literature review will be made. Furthermore, each section will end with a summative discussion detailing surprises, what was learned, what was not learned, and confirmed suspicions throughout the interviews.
Finally, in the conclusion, each major theme will be summarized setting the stage for chapter five.

4.1 Leveling the Playing Field

When discussing the participants’ beliefs about equity within the classroom, there was a great emphasis placed on the need to level the playing field for all students. Each of the participants, throughout their careers, have seen a great deal of diversity within their respective classrooms. As a result, they each agreed that this factor played a significant role on how to approach student learning. Leveling the playing field, according to the participants, required an understanding and appreciation of the types of diversity amongst their students, and the belief that a one-size-fits-all approach is incongruent in meeting the learning needs of a diverse student body.

4.1.1 Types of Diversity That Affect Student Learning.

When discussing the types of diversity that each participant encountered within their respective classrooms, four major categories emerged: socioeconomic status, culture, academic ability, and learning styles. The participants agreed that these factors had an impact on their students’ ability to learn effectively.

When it comes to socioeconomic status, both John and Jeff noted that this was a major factor in a student’s ability to learn. One example that highlighted this point was homework. John is a strong believer in giving homework as it was a way for his students to practice and master the skills they learned about in class. Moreover, he found it a good way to keep parents informed about what their children were learning. However, he also recognized that a student’s ability to complete homework was contingent on the help received at home. Students from homes with high incomes benefited from tutoring, after school programs, and parents with higher education. Students from low income families, on the other hand, had parents or guardians that could not afford the extra help, could not understand the homework, or were unable to help their children because they worked evenings. To make up for this imbalance, John would keep these
students in during recess to help them complete their homework. While he had to give up his
own free time, he found it a necessary sacrifice to help these students learn. Jeff also noted the
same advantages and disadvantages, but differed starkly in his philosophy on giving homework.
From his standpoint, the fact that some students benefited over others was reason enough not to
give it at all. He noted:

Where does the learning take place? Do they have a parent at home who does
math? Do you have a parent home who knows the curriculum? Do they have a
parent at home at all? I have kids whose parents might work till ten at night and
the older sibling is taking care of them and they just go to bed. So, in terms of
equity we must look at: what’s the home life look like?

All in all, students from higher income families were more likely to complete their homework
successfully, giving them a clear advantage within the classroom. This is an example of how one
type of diversity could affect a student’s ability to learn.

According to the participants, another important type of diversity that affects student
learning is culture. John noted that the increase of immigrants within the last 11 years has led to
a beautiful mixture of culture within his classrooms. Jeff, when speaking about how Mississauga
has developed over his 17 years as a teacher, agreed that his population of students has been
extremely diverse in terms of culture, as well. John noted that a students’ culture influences his
or her capacity to learn. Growing up in Kuwait, India, and Canada, John was able to compare
and contrast differing value systems in regards to education. For example, in Kuwait and India,
he argued that education is taken more seriously, leading parents to spend more time and
resources to ensure academic success for their children. John remarks when speaking about
Kuwait, “everyone pushes their kid to study, study, study, learn.” He also notes, “That’s the
culture, you know, after school they’ll sit with you and spend hours and hours trying to teach
you.” However, when speaking about his experiences with Canadian culture, John notes that
such a singular focus on education does not exist. He comments that some parents take their
children’s learning seriously while others do not—the latter believing it is the responsibility of the school and teacher to teach their children. In addition, he adds that there is more of an emphasis placed on extra-curricular activities in Canada than other parts of the world. Speaking about how culture affects learning from a different perspective, Jeff emphasizes the importance of making connections and meaning. In one example, he describes a lesson looking at health and the Canadian Food Guide. Jeff notes that it is important to recognize that many students in a diverse classroom have different tastes, attitudes and values in regards to food consumption. Consequently, students will have a hard time finding connections and meaning from a food guide that does not represent their own personal experiences. As Confrey (1990) suggests, knowledge is constructed through our experiences (p. 108). Thus, finding ways to connect learning with the cultural experiences of a diverse set of learners is an important aspect that affects student learning.

Academic ability was also discussed in great detail throughout these interviews. John, for example, described his typical classroom as consisting of three different programs for three different types of learners: High learners, average learners, and low learners. The high learners learn the material faster and often become bored throughout the day if not challenged. As a result, they need more challenging tasks to keep them engaged. On the opposite side of the spectrum sit the low learners who have been placed on IEPs (Individual learning plans) for low achievement—not necessarily due to learning impairments. John maintains that he has about three to four students on IEPs each year. For these students, the curriculum expectations for their grade level has been lowered to meet their level of readiness. Finally, the average learners move according to the general curriculum guidelines issued by the Ministry of Education. For each of these groups, John tailors his instruction, activities, and homework to meet their unique needs. Similarly, Jeff has seen the same kind of academic diversity through his own experiences—although he did not specify creating three different types of programs. He believes, for example, that his gifted learners need open tasks which allow them to explore and demonstrate their creative abilities, while his struggling students just needed extra assistance. One thing that stood
out was the emphasis he placed on generating hope. According to Jeff, “In terms of students who struggle, the big thing, the first thing, is providing hope and letting them know that it’s not an intellectual thing, but it’s a barrier type thing.”

These perspectives fall in line with research on levels of readiness. Vygotsky (1978), for instance, theorized that people learn best when the task is just out of their reach and in need of support and guidance to master it. He called this level of learning the Zone of Proximal Development. Likewise, according to brain research, students must engage in appropriate challenges in order to learn effectively. If the challenge is above their level of readiness, then the brain overproduces key neurotransmitters that impede learning; conversely, if the challenge is below their level of readiness, the brain will not engage or respond by releasing the necessary chemicals for optimal learning (Tomlinson & Kalbfleisch, 1998). So, a student’s academic ability is another type of diversity that affects their learning. According to the participants and research, it is clear that tailoring instruction to a student’s academic ability is a key factor in learning.

Finally, a student’s learning profile is another aspect of diversity seen in each participant’s classroom. John is keenly aware of the various learning styles and multiple intelligences amongst his student. He notes that most of his students are either visual or kinesthetic learners, but he also acknowledges that others are gifted and learn best through the arts. Jeff, while he did not specifically speak on learning styles and multiple intelligences, did demonstrate his understanding of the subject through his examples of teacher practice, which were uncovered through the descriptive coding method. For example, Jeff allowed his students to practice and demonstrate their learning through speaking (auditory), typing (Kinesthetic), and drawing (Visual), which are common strategies he has used throughout his years as a teacher.

According to brain research, our brains are developed with important differences that have an influence on the way we learn (Sousa & Tomlinson, 2011). In addition, Barbe and Milone (1981) proposed that humans learn through three distinct learning modalities: visual, auditory, and kinesthetic while Gardner proposed that humans are not fashioned with one type of
intelligence, but multiple intelligences (Woolfolk, Winne, & Perry, 2015). It is quite evident, then, that each student learns differently as both the participants and the research agree.

To be clear, the participants in this study both support the idea that diversity has a significant effect on student learning. Whether in the form of socioeconomic status, culture, academic ability, or learning profile, each student enters the classroom with their own unique learning context. Teaching with this context in mind therefore increases the student’s ability to learn and become successful.

4.1.2 One-Size-Does-Not-Fit-All.

Given the data collected on diversity, it is clear that the participants found it an important factor to consider for student learning. As a result, when asked about their thoughts on the term “one-size-fits-all,” it was no surprise that both participants disagreed with the statement. Interestingly, however, both had a different response as to why they did not believe in the statement, which was unexpected. John stated, “I don’t think one size fits all; it doesn’t work that way—not in this country, not in this culture, not in North America.” What struck me about this statement was the fact that it was generally new to me. Personally, I never thought about this issue from a cultural perspective before. Actually, I typically saw the idea behind one-size-does-not-fit-all as a universal truth. Moreover, during my research, I never came across any information supporting such an assertion. To further his argument, John recalled his thoughts on cultural diversity. He acknowledged that classrooms in Ontario are more multicultural than other parts of the world and, therefore, need to approach instruction from multiple perspectives. He also noted, however, that a one-size-fits-all approach could possible work in other parts of the world such as Kuwait, India, and China because these cultures, in his opinion, place a strong emphasis on academic success. For example, parents from these cultures are so focused on their children’s academic success they will spend the extra time and resources to ensure it. So, if the child does not understand the concepts being taught at school, his or her parents will go the extra mile in ensuring they do at home. To be clear, this opinion was formed on the Johns own personal experiences growing in said culture and teaching students from many of the cultures he
mentioned. To test out such an opinion would be difficult with only two participants, but I found it important to mention as it is an opinion that has shaped Johns attitude concerning this matter.

Jeff also agreed that one-size-does-not-fit-all, but his reasoning contrasted with that of John’s. Jeff appeared to be very passionate about this response and even noted that teaching from a one-size-fits-all perspective was potentially damaging to students. He made several analogies to demonstrate how unreasonable this perspective was. In one example, he compared teaching from this perspective to asking a blind person to read the text on a board. He also likened it to other one-size-fits-all approaches in our society such as healthcare, noting that it was a controversial system because it simply did not work for everyone.

Connecting this back to the literature, while both participants do not share the same reasoning as to why they believe that one-size-does-not-fit-all, they do agree that they cannot teach from such a singular lens within Ontario’s educational system. First, Ontario is committed to providing an equitable educational system for all students regardless of their differences. As outlined in Ontario’s “Achieving Excellence” document, ensuring equity in learning is one of the four renewed goals for Ontario’s educational system (Ontario Ministry of Education, 2014, p.3). As a result, it can be argued that teaching from a differentiated lens is necessary in meeting the needs of a diverse student body.

4.1.3 Summarizing Discussion on Leveling the Playing Field.

Each type of diversity discussed in this section reveals the attitudes held by each participant in regards to equitable learning. Both participants recognize that their classrooms are diverse in many ways and think it is important to respond accordingly through differentiated instruction. It can be said, then, that the participants believe it is necessary to adapt their instructional strategies to level the playing field for all students. Not only is this view supported by the research in the literature review, but is also coincides with the hypothesis I formulated based on my literature review and my own experience before conducting interviews. What surprised me, however, was the difference of opinion related as to why a one-size-fits-all strategy does not work, especially when John noted that he found the issue to be a matter of cultural
relevance. John felt that other cultures seemed to accept a teacher-centred perspective and, thus, made the necessary sacrifices to ensure that their students fit that mold. So, if a student was not understanding math, there was no need to try and fit the subject matter around his or her learning styles, interests, or level of readiness, instead the child would simply be given more support at home through practice and persistence. Given that John has been educated across three different school systems in his life time, it taught me to be careful of holding broad universal principles about learning. Just because many may see differentiated instruction as a necessary method of teaching, does not mean that it is accepted in all cultures around the world.

Finally, one area that I had hoped to investigate more was how language, as a type of diversity, affected student learning from the participants. Giving the seemingly growing ELL population in Ontario schools, it would have been particularly insightful to hear the participants’ views in regards to this matter. John did briefly note that with such a growing number of ELL students within the school system, using visualizations to teach was a necessary instruction method for all students. Perhaps this growing population has shaped the way instruction is normally given due its prominence in today's classroom. Thus, strategies that support ELL students are just a normal aspect of instruction today and hardly worth mentioning as a differentiation. What stands out above all from this section, in my opinion, is that teaching from a differentiated lens is not optional. As Jeff puts it, “you know what, oh my God, one-size-fits-all, that’s insane.” Given the sheer diversity in our public-school system, it is rather troubling to that some teachers, like Jeff, still think many teachers employ such a practice today. As a teacher, I believe it is my duty to ensure that all of my students have the opportunity to learn regardless of their differences. Given that learner differences do exist; it is important to respond accordingly.

4.2 The Role of Assessment

It is now clear how each participant perceives the importance of leveling the playing field within the classroom. Differentiating instruction, then, appears to be a necessary response to a
diverse student population that we are increasingly becoming more aware of. Not only did the participants share their beliefs in regards to this issue, but they also spoke about practical strategies that helped inform them about the unique learning needs of their students. Both participants, for example, discussed at length the importance of assessment when it comes to differentiating instruction. One of the main elements of differentiating instruction is teaching according to a students’ level of readiness (Tomlinson and Kalbfleisch, 1998). However, before a teacher can do this effectively, it can be argued that he or she must be able to both assess level of readiness and identify the particular learning profiles of their students. Both participants shared these views and acknowledged how important they were to differentiating instruction. Moreover, they both provided practical strategies they found useful in meeting these needs.

4.2.1 Pre-Assessing Academic Ability.

Pre-assessment was an important factor for both participants. John, for example, makes sure his students complete a diagnostic test to see where they are before the start of a new math unit. Before he starts a unit on money, addition, or subtraction, he gives his students a short test to see where they might be struggling, excelling, or meeting the curriculum expectations. As he notes, “if they can’t do x, y and z and the task requires them to do x, y and z, you know you can’t give them a task like that.” Jeff spoke about a similar diagnostics test, but in the context of reading. To assess the level of readiness in regards to reading, he gives a PM Benchmark Reading Assessment, which he believes sheds light on where the student is and needs to go. As he notes, “you read with the kids for three minutes. You can tell automatically they have a fluency issue, that they have a comprehension issue, right, like just like that you know.” Clearly, both participants find it important to use testing to understand their students’ level of readiness. Whatever the subject, assessment tests are practical tools that teachers can use to differentiate their instruction per a student’s level of readiness.
4.2.2 Pre-Assessing Learning Profiles.

When participants were asked about their strategies for assessing the learning profiles of their students, the importance of knowing their students was shared by both of them. According to John, “It’s knowing the student right; I would say it’s observing right.” John firmly believes that taking the time to talk with students and observing their work for strengths and weaknesses leads to an understanding of how they individually learn. From this type of informal observation, he is able to distinguish whether a learner is visual-spatial, or bodily-kinesthetic. For example, during the first two weeks of school, he will speak to his students one-on-one to discover their interests, hobbies, and find out what extra-curricular activities they attend, if any. From these informal chats, he notes that students who take ballet are probably good bodily-kinesthetic learners, or students who take art will more likely learn better through visual-spatial strategies. Moreover, these observations are strengthened when he see’s students that appear to be bodily-kinesthetic excel in physical education, while the ones who seem to be visual-special do well in visual arts. Using such interviews to not only bond with students, but also to assess their multiple intelligences was a new insight for me. In a way, it appears to be a more authentic way of assessing a student’s learning profile than a pen and paper test. Jeff followed a similar strategy for assessing his students’ learning profiles. Jeff believes that is critical to start the year by building trust with the students in order to learn who they are. For example, he routinely does a learning inventory in the first week to have an idea of where his students’ passions lie. He not only does this to help give him a better understanding of his students’ strengths, but also to give them an understanding of their own strengths as well. Throughout his interview, Jeff spoke at length about empowering his students to understand their own strengths while giving them the freedom to express their learning in unique and creative ways. For instance, a group of his gifted learners wanted to demonstrate their learning of the human organ system through a dramatic play. Instead of discouraging the idea, he supported it by making sure they understood the learning outcomes they would have to demonstrate if they were to take up the challenge. This allowed his students to draw on their strengths and gifts to show their learning.
Much was said in the literature about learning profiles that support strategies used by the participants in this study. According to Dunn, Beaudry and Klavas (2002), “learning style is a biologically and developmentally imposed set of personal characteristics that make the same teaching method effective for some and ineffective for others” (pg. 75). Both participants, through their strategies, were able to embody an appropriate response to this understanding of human learning. By assessing their students learning profiles, each participant was able to gain a good understanding of how their students’ learned best, thus, allowing them to provide learning experiences that tailored their instruction to these strengths.

4.2.3 Summarizing Discussion on the Importance of Assessment.

Overall, both of the participants are well aware of the important role assessment plays in differentiating instruction. Not only are they aware of it, but they embody it in their practices as well. What was surprising to me was John’s use of informal data to assess his students’ learning profiles. From my experience, traditional pen and paper inventories are typically used to uncover such information from students. The use of interviews and conversations represent a unique and authentic way to draw similar conclusions. This also represents an important learning experience for me as, going forward, I will seek to use both forms of data to better understand my students learning profiles. Many of my intuitions were also confirmed through both of these interviews. For instance, it makes practical sense that a pre-assessment or diagnostic test is a good way to assess what students learn and, hence, their levels of readiness. Moreover, getting to know students through informal conversations and day-to-day observations can help a teacher understand the strengths and needs of his or her students. Information on summative assessments, however, was generally not explored as both participants mainly focused on pre-assessment and ongoing assessment strategies. Jeff did provide one example where he allowed his students to demonstrate their product through drama, but I would have liked to learn about more summative assessment strategies through these interviews.
4.3 Addressing Students’ Needs

After discussing the reality of diversity within the classroom and the need to level the playing field through differentiated instruction and exploring how assessment can be used to discover what students need in terms of level of readiness and learning profiles, we will now consider the question of addressing each students’ need via strategies of differentiated instruction. While several such strategies were already discussed in previous sections, this section will focus on ways of addressing the needs of high achieving students, low achieving students, and average students.

4.3.1 Addressing the Needs of High Achieving Students.

When asked how he supported higher achieving students, John noted that it was difficult as balancing the needs of both his low achieving and high achieving students was difficult. John observes:

Sometimes higher achievement students get, you know, thrown on the wayside cause you’re trying to attack these low, the low achievers, that are not performing on par or at least on average, trying to get those lower students and bring them up to average. So somehow these higher achieving students do go, not neglected, you just don’t have the time.

John laments the importance of keeping this issue in mind when supporting high achieving students. In his opinion, teachers need to make a conscious effort not to forget them and find ways to differentiate their instruction to meet their specific needs. One strategy John uses to support these learners is by using deep and rich tasks. For example, instead of providing more difficult work at a higher-grade level, he will create cross-curricular activities that incorporate three or more subjects to go deeper into the curriculum. Per John, these types of rich tasks provide an outlet for these students to explore through inquiry, think outside the box, and make use of their creative abilities. For example, if students are tasked with building a structure
at the end of a science unit, the higher achieving students could be asked to connect mathematical principles of measurement to further enrich their learning experience.

In response to the same question, Jeff noted that is important to first identify how these higher achieving students can be challenged and then open the door to both input and output possibilities. Similar to John’s perspectives, Jeff modifies tasks in order for students to show their learning in unique and creative ways. For example, for a grade six activity, his class was tasked with building electric cars. In order to modify this activity for his high achieving students, he asked them to build a functioning car with three wheels instead of four. As a result, an activity that was designed for the whole class was easily modified to become more challenging for his higher achieving students. Jeff notes, “The big thing for them is not constricting their output.” In other words, and similar to Johns perspective, it is allowing these students the freedom to show their learning in ways that matter to them.

The research of Linn-Cohen and Hertzog (2007) specifically looked at how to differentiate instruction for gifted students. Their research found that providing gifted students with integrated curriculums, substantial choice about what to learn, and deep connections between what they learned in school and the real world, motivated and satisfied their learning needs. Many of these same strategies were outlined by both participants showing a strong connection between their strategies and the research.

4.3.2 Addressing the Needs of Low Achieving Students.

John maintains, in his opinion, that his lower achieving students are extremely bright, but are in need of more one-on-one support. He argues that most of the high achieving and average students probably benefited from richer support at home when they were younger, explaining why they appear to be more advanced learners. Apart from designing a specific program for his lower achieving students, John believes that the key to meeting the needs of these types of learners is more time and support. His key strategy, then, is to enlist help of volunteers and
support staff to divide and address the needs in his classroom. With this extra support, his low achieving students received the one-on-one support they desperately needed.

Similarly, Jeff begins with idea that low achieving students are very capable. He notes, “the first thing is providing hope and letting them know that it’s not an intellectual thing but it’s a barrier type thing.” He believes it is necessary for these students to develop self-belief and confidence to motivate their learning. Once the students have this positive mindset, he contends it is just a matter of providing these students with tools that will enable them to become more successful. For example, Jeff strongly believes that assistive technology can be the difference between a child sitting for 45 minutes and writing 10 words, or using voice-to-text technology and communicating two paragraphs. When it comes to math, a struggling student could benefit from the use of manipulatives or the use of friendlier language to solve word problems. All in all, both participants tend to agree that low achieving students are capable of excelling academically. What is needed, are appropriate supports to help make up for what they are lacking. Whether it be one-on-one support, assistive technology, or tools that support their particular learning modality, these students can benefit from a differentiated strategy.

While not all of the strategies discussed by the participants can be specifically linked back to the literature review, the overall spirit of differentiating instruction is evidently present. According to Tomlinson and Kalbfleisch (1998), “differentiated classrooms are responsive to students’ varying readiness levels, varying interests, and varying learning profiles” (p. 54). In other words, each of the strategies outlined by the participants were conceived to meet the varying needs of their low achieving students. These strategies took the students level of readiness into consideration by tailoring the instruction to their academic needs. The use of technology not only provided assistive support, but was a natural motivator due to its form and function while the use of manipulatives connected directly with the students learning profiles.

**4.3.3 Addressing the Needs of Average Achieving Students.**

Each of the participants provided many examples on how to meet the needs of both high and low achieving students; however, both believe that many of these same strategies can work
with the average learner as well. John, who taught kindergarten during his first years as a teacher, recognized that providing students with multiple styles of input (visual, tactile, music) is beneficial to all. Moreover, he contends that all his students are provided with strategies such as manipulatives, counting charts, extra time, and strategic grouping for peer support as needed. Jeff suggests that using inquiry to integrate the curriculum is a strategy he uses for all students. Whereas John used such a technique solely for his gifted students, Jeff found that it was appropriate for all his students learning needs. In addition, Jeff also allowed his average students to participate in the activities modified for gifted students. For example, if an average student wanted to try and create a three-wheel electric car, Jeff would not constrict his or her opportunity to do so.

In many ways, differentiated instruction seems to be an equitable practice that sees no biases. Whether you are a high, low, or average student, a differentiated lens seeks to see students as individuals across a continuum. Carol Ann Tomlinson identifies four main components that teachers can differentiate: content, process, product, and learning environment (Tomlinson, 1999, p.11). It can be argued that each of these components represent the elements of a day-to-day classroom. So, when differentiation occurs, the whole class becomes involved in the process. As noted, the strategies used for each type of learner in this section can be used for all. Interestingly, the interviewees did not describe their differentiation strategies according to all of these components. Instead, they seemed to primarily focus on the content component. Perhaps this could explain why some argue that differentiated instruction does not work, as it is not being implemented appropriately enough to be effective.

4.3.4 Summarizing Discussion on Addressing Students’ Needs.

In researching this topic, I was surprised to discover that there was considerable overlap when it came to the strategies that supported the needs of students. Each strategy was not isolated to one group, but could be used across the spectrum of learner variance. Moreover, many of the strategies used provided a practical framework for the theoretical one discussed in the
literature review. As expected, each participant was able find appropriate strategies to meet the needs of all students.

4.4 Going Above and Beyond

In considering the question of whether differentiated instruction makes sense as an instructional strategy, both research participants affirmed its value but also noted that it required substantial time and work to be effective. John notes, “It takes a lot of my time, you know, you do three different tasks all at the same time, it takes a lot of time.” When speaking about teachers who do not differentiate, Jeff contends:

If you’re a one-size-fits-all teacher your working a five-hour day? Six-hour day? Because if you’re one-size-fits-all, you’re not differentiating. That takes time, you’re not talking to kids, you’re not meeting with other colleagues—that takes time. So, if you’re one-size-fits-all, you’re basically working five to six hours a day.

While Jeff’s remarks are disapproving to those who do not differentiate, he nonetheless highlights the fact that differentiated instruction is a teaching strategy that requires time and effort. It is not enough, then, to just teach according to the bare minimum. If a teacher wants to ensure that he or she is meeting the needs of a diverse set of learners, they must go above and beyond the basic expectations of the profession. One of the critical questions discussed in the literature review was whether differentiated instruction was a practical or, even, reasonable teaching strategy. Considering the comments made by the participants in this study, that question seems entirely up to the teacher’s views. While some teachers might find the work involved in differentiating instruction for their students impractical due to the time and effort required to make it a success, others just see it as one of the many aspects of a passionate teacher.
4.5 Conclusion

In conclusion, the analysis completed in this chapter has identified four central themes. The importance of leveling the playing field led to a discussion on equity. Today’s classrooms are full of different types of diversity ranging from socioeconomic status, culture, academic ability, and learning profiles. Findings in brain research support the notion that humans learn differently and require appropriate stimulation according to their level of readiness for effective learning to occur.

Second, assessment is a significant element in differentiating instruction. Both the pre-assessment of academic ability for subjects such as math and language and the assessment of student learning profiles are important to differentiating instruction. Again, the research shows that teaching according to a student’s level of readiness and tailoring instruction to meet the needs of his or her learning style is important to learning. One key finding I found important was the use of informal and formal data collection to assess a student’s multiple intelligence. This provides a deeper and more authentic strategy to assess a student’s learning profile.

Third, after discussing the realities of diversity within the classroom and the need of assessment strategies to help inform teachers of what students need, a discussion on addressing students’ needs took place. The needs of high achieving students, low achieving students, and average students was discussed. The most important conclusion here is that differentiating instruction benefits all students regardless of their academic needs and abilities, resulting in a truly equitable teaching practice. Moreover, the literature draws the same conclusions as differentiation requires the modification of content, process, product and learning environment—arguably all the elements that make up an everyday classroom.

Finally, the analysis concluded that differentiated instruction is a viable teaching strategy. However, it is also one that requires teachers to go above and beyond. Simply teaching according to the minimum requirements of the profession is not sufficient enough to meet the needs of a diverse set of learners. In many ways, one’s perspective on teaching figures into whether they think the practice is viable or impractical.
My initial thoughts going into the interviews was that the participants would agree that differentiated instruction was an idealistic strategy—one that was complete in its parts, but deficient as a whole. As the research previously reviewed did not yield any substantial empirical evidence supporting differentiated instruction as a holistic strategy, I inferred that the strategy was good in theory, but not in practice. These assumptions shaped my impression of the answers I expected in the interview as I believed the overall tone would be negative. In contrast, the participants wholeheartedly embraced the strategy, even wondering if it were possible not to differentiate in today’s classroom. All in all, the most significant insight from this analysis was the that differentiated instruction is a viable teaching strategy that passionate teachers will employ, even if it means going above and beyond what is expected to make it work.

In chapter five, the implications of this study will be discussed in terms of the educational community and on me as a teacher and researcher. The former will discuss how this research can inform everyday school practices, while the latter will build on what I have learned and how this learning has influenced my thinking. Furthermore, I will outline several recommendations for educational professionals and institutions based off my overall findings. Finally, I will conclude with a list of critical questions that emerged during the research process and final summary conclude the paper.
Chapter Five: Implications

5.0 Introduction / Overview

The present study was designed to learn more about teachers’ attitudes and practices regarding the use of differentiated instruction differentiating instruction in elementary classrooms. The findings serve to support the extant literature pertaining to differentiated instruction and to specifically tell us more about what teachers think about its merits and the practical strategies currently being implemented in classrooms today. For example, the literature revealed that differentiated instruction is made up of research conducted on the benefits of instructional strategies such supporting student’s interests, levels of readiness, and learning profiles. Through the data collected, the interviewers seemed to consider these elements of differentiation through their own pedagogical practices and discussed specific examples on how these practices were implemented. This chapter summarizes the research findings, highlights the present study’s implications for various stakeholders, provides several recommendations, and suggests directions for future research.

5.1 Key Findings and Their Significance

Following interviews with two educators, a rigorous analysis revealed four important themes:

1. Leveling the playing field.
2. The Role of Assessment.
3. How teachers address students’ needs.
4. Going above and beyond.

The first theme, leveling the playing field, served to remind educators that equity plays a significant role in how to approach student learning. Given the many types of diversity seen in the classroom today (socioeconomic status, culture, academic ability, and learning styles), educators must be aware of how these differences affect student learning and tailor their instruction to suit them equitably. Alternatively, when diversity in student learning is ignored,
educators often fall into a one-size-fits-all perspective of teaching where instruction suits a handful of students as opposed to all. The findings of this study affirm that educators who acknowledge the important role that diversity plays in student learning will utilize differentiated instruction to meet the needs of all their students. That is, they appreciate that one-size-does-not-fit-all and, as a result, differentiate their instruction to level the playing field within their classrooms.

A second finding, the role of assessment for differentiated instruction, highlights the importance of assessing both the level of readiness and learning profiles of students. To differentiate instruction effectively, educators must know their students which entails pre-assessing both academic ability and learning profiles. Whether it be a diagnostic test before a math unit, a PM Benchmark Reading Assessment, informal conversations about student hobbies, or learning inventories, there are a number of ways educators can gather valuable data that will help them better assess and know their students’ strengths and weaknesses. With this knowledge in hand, educators can respond to learner variance in ways that are both meaningful and effective.

The third finding, addressing student needs, focuses on levels of student achievement—namely, high achieving students, low achieving students, and average students. Given the varying needs of students within each of these groups, educators have to be flexible with content, process, product, and learning environment (Tomlinson, 1999). In other words, teachers have to modify each aspect of their instruction in ways that will transform the whole class. Interestingly, the findings revealed that the methods and strategies used to meet the needs of each of these groups had considerable overlap. Meaning, consequently, that the same strategies could be used across the spectrum of learner variance.

Finally, the fourth finding recognizes the importance of going above and beyond. While the data suggests differentiated instruction is a teaching strategy that makes sense, it requires substantial
work and time to be effective. Simply put, teachers who differentiate appropriately must put in more than the provincially mandated time to meet the many needs of their students. Anything else would be a disservice to the students within the classroom.

5.2 Implications

The present study has important implications for educational reform. In broad strokes, this study should serve as a reminder to policymakers and curriculum planners that differentiated instruction is integral to Ontario’s renewed vision for education in this province: Namely, their goal of ensuring equity for all children and students by delivering education that inspires all students to reach their full potential through the access of rich learning experiences (Ontario Ministry of Education, 2014). Consistent with the conclusions of Tomlinson (2000), the present study finds that differentiated instruction is a teaching strategy that can foster high levels of academic achievement for all students. The study also provides novel insight into the considerable amount of work and time needed to differentiate instruction effectively, which would suggest that teachers may benefit from more planning time and resources. Policymakers should take heed to these concerns as their visions for an equitable educational system need to trickle down into the classroom through stronger support and more frequent assessment classroom practices. Not ensuring this, arguably, will maintain and perpetuate the dreaded one-size-fits-all perspective of teaching within Ontario classrooms. Deficit thinking, academic failure, and an ever-widening achievement gap are all possible outcomes such a style of teaching.

The present study also has three specific implications for the educational community. I will draw reference from my positionality statement to contextualize these recommendations. My wife fell victim to a one-size-fits-all perspective of teaching throughout her educational journey. Thus, she lacked the proper supports and empathy needed to help her succeed, academically, at an early age. While attending college, a professor, while observing her taking a test, noticed that she might have a learning disability. With his recommendation, she eventually got tested and was subsequently identified.
First, one teacher was able to change her life with a simple observation—one that was desperately needed earlier in her life. If educators ignore the differences of students within the classroom, they can cause tremendous setback for students. In this specific situation, the failure to assess her learning disability was the cause of her personal setback. As outlined in Ontario’s “Achieving Excellence” document, ensuring equity in learning is one of the four renewed goals for Ontario’s educational system (Ontario Ministry of Education, 2014). As a result, it can be argued that the role of effective assessment in differentiated instruction is necessary in meeting the needs of a diverse student body. This is not only echoed by the Ministry of Education, but by both participants in this study as well as the extant literature (Tomlinson, 2000a).

Second, educators who fail to go above and beyond to effectively differentiate their instruction, subject their students to a one-size-fits-all method of instruction. As gleaned from the literature review and the interviews, there seems to be no way around the time and effort needed to facilitate effective differentiated instruction. As a result, the task falls in the hands of individual teachers who are willing to make sacrifices for the betterment of all their students. However, when teachers choose to operate within the status quo, they empower only a fraction of their students. Consequently, many students will fall to the wayside as their needs are not being met.

Third, not meeting the needs of all students is an issue of equity. As consistent with the Ontario’s Equity and Inclusive Strategy (2014), high levels of achievement, reduced gaps in student achievement, and increased public confidence in publicly funded education are core priorities in Ontario’s education system. Failing to meet the needs of a diverse population of students, through differentiation, is also a failure of the core priorities of this province. As a publicly funded institution, the Ministry of Education has a responsibility to the citizens of this province. Providing an effective education system for all, then, is necessary in meeting this responsibility. Thus, it is of paramount importance that the province, to evoke a popular idiom, practices what they preach. In other words, it is not enough to only speak about equity, we must fulfil it as well.
5.3 Recommendations

The implications of the present study point specifically to several recommendations for ministries of education, school administrators, and teachers. Four recommendations will be outlined below:

(1) In terms of the Ministry of Education (2014), it needs to take ownership of its own vision. As outlined in its Achieving Excellence Vision and Equity and Inclusive Education Strategy documents, Ontario has committed to providing an equitable education system for all its citizens. However, this vision must be realized in the day-to-day classroom. Given this, it is recommended that the government increase funding to provide the necessary support and resources that schools need to differentiate instruction effectively. This funding can be used to hire more support staff for each classroom, more professional training in differentiated instruction, and supplies. Moreover, it is recommended that the Ministry of Education develop a system of check and balances to hold schoolboards, school administrators, and teachers accountable for ensuring equity for all students. This can come in the form of positive reinforcement through incentives, bonuses, and award recognitions. While seemingly controversial, teachers must also understand they are professionals and must act accordingly. Thus, negative reinforcements might be necessary in some circumstances—within reason, of course. This is not to say that teachers should be at risk of losing their positions, but they benefit from provincially mandated professional development programs to ensure their teaching practices are effective and current.

(2) In terms of teachers, it is important that they receive adequate professional training in differentiated instruction and access to easy-to-use resources. From my personal experience taking a teacher education program, there were only a few lessons related to the topic. Consequently, teachers may be coming out of teachers’ college with little to no understanding of what differentiated instruction is and how to apply it
effectively within the classroom. As a result, and in relation to the previous recommendation, professional training in differentiated instruction should be made mandatory for all teachers. In addition, it is recommended teachers work collaboratively in order to ease the workload and possible teacher burnout. Having opportunities to share ideas, resources, and strategies will only help to improve the educational experiences of students. In addition, easy-to-use resources can be developed alongside the curriculum to give teachers insights into how to appropriately differentiate. For example, pre-assessment tests for interests, level of readiness, and learning styles can be made available for teachers to photocopy our access through online applications. Subsequently, examples of modifications based off those pre-assessments can be provided to help teachers tailor their teaching to meet the various needs of each of their students. Activities at varied levels of readiness, that are interesting and engaging, and that take learning modalities/intelligences into consideration are a few examples of effective resources that teachers can benefit from. All in all, more training and access to resources are important ways that teachers can improve their differentiated practices.

(3) It is recommended that teachers and the Ministry of Education utilize technology as a way to offset the workload of differentiation. From the teacher’s perspective, there are many applications available to aid in assessment and organization, and self-learning. These applications can be used to help manage the needs of all students. For example, teachers can keep track of students work through pictures, video, audio, and digital notes. In addition, these artifacts and anecdotal notes can be stored and subsequently retrieved through simple queries. This provides a powerfully organized medium for assessing and tracking levels of readiness. Also, teachers can make use of resources like YouTube and Khans Academy to facilitate more student directed self-learning within the classroom. This can free up teachers to spend more time with students requiring assistance, but also provide higher achieving students to take
ownership of their own learning. To be clear, training on such technologies would be recommended, which might, in fact, add to the workload. However, once part of everyday practices within the classroom, the benefits will far outweigh the negatives as such technology is designed to be self-sufficient. These ideas are predicated on the fact that these technological resources are available; once again, speaking to the need for more funding from the province to ensure that access to technology is readily available to both teachers and students.

(4) Finally, it is recommended principals set the tone for differentiated instruction within the school community. Principals need to shape a vision for equitable learning for all students. It is important they share and foster high expectations for both teachers and students. Teachers need to be regarded as professionals and, thus, encouraged to take risks and continually maintain high expectations for all students.

5.4 Areas for Further Research

Since the present study has served to expand upon the extant literature, it has also highlighted the need for further study. In future research endeavours, it is recommended that a greater emphasis be placed upon how differentiated instruction relates to social factors such as social economic status (SES) and culture. These major aspects of learner variance emerged throughout the interviews, but were scarcely identified in the extant literature. Given the importance these factors play in student learning; more attention needs to be placed on how to differentiate instruction according to these differences.

Furthermore, there is also a surprising lack of emphasis placed on the use of technology to differentiate instruction. As discussed throughout this study, one of the main issues with differentiated instruction is the time and effort required to meet the needs of all students. Current advancements in technology, when used reasonably, can offset the workload in several ways. One particular area of technology that can aid teachers is machine learning, which is a type of artificial intelligence that can search through swaths of data to look for patterns and useful
inferences in mere seconds. Theoretically, student assessment data entered into programs utilizing this technology could be analyzed and interpreted without the need of human intervention. Harnessing such power in the classroom can help teachers work more efficiently as many of the mundane and time consuming tasks can be offset to free up time for better planning and instruction.

5.5 Concluding Comments

The present study is important because it details a teaching strategy that can help the government take ownership of its vision—providing an equitable education for all students—as there seems to be a gap between the broad visions of the government and realization of them within the classroom. Differentiated instruction provides an elegant framework that teachers can use to ensure this vision becomes a reality. As a result, the government shares in responsibility by providing the funding and systems of checks and balances to ensure differentiated instruction is being enacted within the classroom. Through the interview sessions, it became very clear there are teachers who understand that diversity plays an important role in student learning. Moreover, they also recognize differentiated instruction is a reasonable medium of delivering equitable instruction. However, they also acknowledge that it requires considerable time and effort. Therefore, considering the governments vision for a more equitable system; the desire of teachers to facilitate this; but, also, the institutional and personal roadblocks to making this a reality; it is recommended more emphasis in research is placed on solving this problem. In terms of further research, then, a greater emphasis needs to be placed on expanding what constitutes diversity by including both SES and cultural factors into the conversation, and, also, how to harness new technologies, like machine learning, to help teachers better differentiate.
References


Differentiated instruction in the regular classroom: What does it mean? How does it look?

Understanding Our Gifted, 14*(1), 3-6.


Appendix A: Letter of Signed Consent

Dear __________________________,

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 teachers’ attitudes and practices on differentiating instruction with elementary students. I am interested in interviewing teachers who are currently teaching or have taught elementary school students. I think that your knowledge and experience will provide insights into this topic.

Your participation in this research will involve one 45 to 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 research coordinator Dr. Angela MacDonald. 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,

Johann Lue

Course Instructor: Angela MacDonald

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/Questions

Introductory Script

Thank you for agreeing to participate in this research study, and for making time to be interviewed today. This research study aims to learn about teachers’ attitudes and practices on differentiating instruction with elementary students for the purpose of finding out if differentiated instruction makes sense from a practical standpoint and effective strategies used to meet the needs of a diverse body of students. This interview will last approximately 45-60 minutes, and I will ask you a series of questions focused on your experiences related to differentiating instruction with your students. 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?

Background Information

1. How long have you taught at the elementary level?
2. What grade(s) do you currently teach/taught in the past?
3. Is there a particular subject area that you specialize in?
4. How diverse has the population of your students been throughout your career?
5. Have you taken any professional development on diversity & inclusive education?
6. Have you attended any workshops or related professional development programs on differentiated instruction?

Teacher Practices

7. Where and when have you used differentiated instruction with your elementary students?
8. How have you implemented differentiated instruction with your elementary students?

9. What types of accommodations have you made to support the individual needs of your students?

10. How have you supported the learning needs of students with either high achievements or low achievements?

11. How do you motivate students to learn?

12. How do you assess and meet the needs of your student’s level of readiness?

13. How do you assess and meet the needs of student’s individual learning profile?

14. How do you prepare your lessons include differentiated instructional strategies?