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The Challenge of Teaching in Urban Schools: A Dialogue with New York City Mathematics Teachers

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THE CHALLENGE OF TEACHING IN URBAN SCHOOLS: A DIALOGUE WITH NEW YORK CITY MATHEMATICS TEACHERS

by

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A dissertation submitted to the Graduate Center Faculty in Urban Education in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York

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This manuscript has been read and accepted for the Graduate Faculty in Urban Education in satisfaction of the Dissertation requirements for the degree of Doctor of Philosophy

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ABSTRACT

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by

Martin Stuart Wilson

Advisor: Kenneth Tobin

KEYWORDS & PHRASES & TERMS used throughout this dissertation.

Cogenerative Dialogue, Radical Listening, Hermeneutic phenomenology, Hegemony, Polysemia, Polyphonia.

In this dissertation I seek to examine and expose the world of teaching, and particularly the world of teaching mathematics in public middle schools and high schools in New York City. These schools are administered by the New York City Department of Education (NYCDOE) which each year is responsible for the education of over one million students. In this research I aim to help participants and connected others better understand the work that teachers do in these schools. I also intend to make meaning from watching, working with, and listening to the people who work there. I examine what teachers do, including the instruction, their evaluation, curriculum changes, and pathways for students. When the work that they do and the challenges that they face are understood, then teachers and those of us in a position to make decisions that

impact the work of teachers, can make more informed choices. Teaching is a grave responsibility. The lives of our children are impacted every day by the work our teachers do.

This dissertation is participant research. All participants including the researcher have an impact on the study as they do on the practice of teaching. The methodology is hermeneutic phenomenology – making sense of what's going on. I designed the research to be emergent so the direction and focus of the research are contingent on what is found during this event oriented inquiry. I am not aiming to prove a hypothesis or some other predetermined outcome. My aim is to learn about individuals and the work that they do. It is not an aim to converge on a single conclusion. I hope that participants will reevaluate and modify some of their axiologies and ontologies as they better understand their profession both through their own eyes and the eyes of others.

I also designed the research to combine the experiences of professional educators through their eyes and through mine. I selected people serially and contingently. Some were selected because they broke the rules, and some were selected because they didn't fit. Some were selected because they differed in a number of ways from previously selected participants. Differences include age, gender, race, experience, reputation, and attitude. Differences also include the way that participants teach.

Data collection involves a number of methods including observing, listening, taking part in cogenerative dialogues, and recalling my own experiences since I began this work in 2003. While this research mostly focuses on the work of mathematics teachers, my work also involves spending some time with administrators. This provides a valuable insight into aspects of teaching from an administrator's standpoint and helps me understand this work from a more balanced perspective.

This research is an opportunity to understand important concepts and theories as they apply in a school setting. Methods such as radical listening and cogenerative dialogue have helped me to reevaluate how I do my job, and how I see the work of teachers. It is also important that we understanding the challenges imposed by hegemonic practices resulting in embedded crypto positivism throughout the system. The frustrations that result from a system that often adheres to a single approach to instruction, classroom management, or planning can prove detrimental to a teacher's efficacy, and could impact their self-esteem and ultimately their willingness to stay in the job.

There are very few professions that lose members at the rate teaching does. Teaching in an urban setting can be stressful, but it can also be rewarding. Anecdotally, teachers often say that they are not treated like professionals. Many feel that their judgment is not respected, and that they find it hard to use initiative because it does not always reflect current 'policy'. There does not appear to be a great deal of trust between the tiers of authority and teachers are often subject to a 'gotcha' mentality.

The NYCDOE prides itself on the diversity that is central to its student and teacher population. Diversity adds a quality and a richness to a community that is hard to measure. It would make sense to establish pathways that cater to a wide range of needs and abilities. Students learn at different rates and start at different levels but the idea that all students should go to college is the current mindset. A few decades back, the vocational education schools were phased out, and as a consequence, a range of important pathways were lost. Vocational education where it is available is still seen as a pathway for lower performing students rather than a desirable and equally valued alternative to a college pathway.

Finally, the message of diversity is everywhere, but the practices of embracing and catering to diversity are harder to find. The dominant mindset is one size fits all. All students are expected to graduate at a given age. Schools have for years been penalized if students don't reach the required level, and until recently, schools were not rewarded for progress particularly in lower performing students. There are many talented and hardworking teachers working in our urban schools, and many of these are successful despite the barriers that abound.

It is also important to note that an understanding of important historical facts will assist will help us to understand current practices. Organizations such as the NYCDOE have an enormous, challenging, and many-faceted job to do, and in many cases change is needed. Such change can be slow and incomplete, as any major change requires training and acceptance by all participants. Changes might involve curriculum, assessment, teacher evaluation, policy on vocational education, school closure and downsizing, to name a few.

Chapter 1 begins with a brief examination of the multiple facets of the research to follow. Topics include curriculum, goals of the research, and teacher evaluation, as well as methods, methodologies, and research interest. Chapter 1 outlines topics that will be examined in more detail in subsequent chapters.

Chapter 2 begins with my own story as a way of understanding how my own pathway has influenced my thinking about teaching and pathways in contemporary New York City. The chapter also includes a number of short vignettes about teachers that I have worked with over the period 2003 – 2018 as we begin to build a picture of teaching mathematics in an urban setting.

Chapter 3 introduces Marissa. Marissa is initially selected because she was willing to take part in the research and has strong views on many facets of teaching and issues connected to

teaching. She is young, hardworking, and optimistic. After five years of teaching she is already a leader.

Chapter 4 tells George's story. This teacher was different in many ways from Marissa, and initially reluctant to take part. His story brings to light a series of events that are both sad and concerning that emphasize and bring to the fore, the high cost of alienating talented and hardworking people.

Chapter 5 introduces people at three different levels – a student, a teacher, and a principal. These people are not necessarily typical of others in their position, but are an example of real people and their struggles and successes. It also reinforces the multilayered diversity of our school populations, and as such is a fitting preamble to chapter 6. This chapter emerged during the research as the issue of diversity recurs. While we proudly embrace the enormous diversity of our students and teachers, we place values on particular pathways while discarding others, and tacitly endorsing the one size fits all mentality.

Chapter 6 examines the current mindset that directs all students to a single pathway - college. In this chapter I discuss through the stories of a number of different professionals, how we undervalue the important work that these people do, and how we fail to value such pathways as viable and valuable alternatives to a college pathway.

Chapter 7 brings the story to a close by reviewing the important stories of the two main participants, and the impact of a system embedded with a culture that often devalues the work of its own professionals, to the detriment of our greatest resource – the children.

DEDICATION

To my Mum and Dad who both passed away in 2016 after 65 years of marriage. Thank you for always giving your all. I miss you both very much.

To my wife and family, thanks for putting up with my absences and losing me for large periods of time! Thanks for always being encouraging and supportive!

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Many people have contributed to the work culminating in this dissertation. They include the teachers and students in the schools I have worked at, my fellow doctoral students at the Graduate Center and NYU Steinhardt, and the amazing professors at the Graduate Center.

Kenneth Tobin – thanks for agreeing to be the chairperson of my committee and for being my mentor from day one. From our first conversation, and after my initial surprise at being accepted into the program, through our coursework together, and through the dissertation process, your advice and support have always been outstanding. Thanks for your patience and understanding, and for believing in me. Thanks also for keeping me aware of time constraints and helping me to set goals. I think that, thanks to you, I really have changed the way that I think about the teaching profession. I have learned to value and appreciate the fact that people are different and that these differences are something to be treasured in our quest for doing the best that we can.

Gillian Bayne, thank you for willingly giving up so much of your time when you had a young family to care for and a full-time workload. Thanks for being so understanding and accepting with my ideas.

Stephan Brumberg thanks for your friendship and amazing classes. Your knowledge was inspiring. My only regret was that I only had one class with you! Despite this you regularly assisted me with advice and ideas throughout my coursework and dissertation.

Konstantinos Alexakos – even though I didn't work with you, your book about being a teacher researcher was for me, a godsend. It helped me understand the really important ideas and concepts that I needed to write my dissertation – so thank you!

Thanks also to the members of the Tuesday night research quads. These nights were invaluable in terms of feedback, encouragement, goal setting, and comradery. Ken, Mitch, Ivonne, Amy, and the team – thank you all!

I should also say a particular thank you to Mitch Bleier, who read many of my first drafts and gave me very useful feedback. Mitch, who recently graduated with his PhD, is an amazing writer and reviewer, who has a way of delivering his ideas that is powerful, yet enjoyable to read. Mitch would regularly show me a one or two page piece that he had not managed to squeeze into his dissertation that told an important story. He had a way of using a story to deliver a message that was more powerful than directly stating the message itself.

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GETTING A SENSE OF THE WORK TO FOLLOW

I always assumed that an introduction is written first, as a way of setting up the work to follow. In the case of my research, this introduction was almost the last thing that I did. This should come as no surprise given the nature of emergent research. Right from the beginning I knew that I wanted to better understand the nature of mathematics teachers and mathematics teaching in urban schools. What I found as the narrative progressed was that the playground had many players. The reason that a narrative is a good fit for authentic inquiry is that narratives, like all stories, are not descriptions of everything that happened, they represent an author's account what actually happened.

When we look at the state of play in New York City schools, a great deal of what is happening today is mediated by historical events from the beginning of the public school system. By understanding the practices and cultures historically embedded in the system, we can better understand thinking and practice. In this research I consider important areas such as curriculum, downsizing schools, teacher attrition, and teacher evaluation as they appear in the dissertation.

Pierre Bourdieu developed what he called his "third way" in which he considered opposing theories and by understanding both he gave more strength to his own argument. This was a much more nuanced approach than just taking one side or the other (Maggio, 2017, p.5). This is an important model for this research because listening to others' voices and considering others' points of view (polyphonia and polysemia) mediates the researchers' own emerging understanding.

Likewise, while I think it is important to note that my 15 plus years as a mathematics education consultant in New York City schools give me a strong point of view that definitely impacts on how I view the work that mathematics teachers do, it is important to note that I have

presented scenarios that could be interpreted as being pro teacher and anti administration. My job involves work with teachers, assistant principals, and principals. Principals often have to make decisions that they are unhappy about because they too are under scrutiny. Administrators are often just as impacted by the crypto positivism that is embedded in the system, as the teachers are.

I have used a system of end noting that helps explain the actual evidence or theoretical underpinning whenever there is a claim made in the narrative, to allow for the narrative to better flow, and the reader to not be distracted by such issues. I have also used the annotated bibliography to provide a little more understanding of a statement or issue as the need arises. Unless otherwise indicated, all participants names used in this dissertation are fictitious.

While the research is primarily focused on two main participants, I found that the process was far from linear (to use a well-worn mathematical idea), but was instead more like a web, sometimes spreading in unforeseen directions. Once I began talking to the teachers, so many important ideas came into focus. Each of these areas was important because it impacted on the work of mathematics teachers in urban schools. Areas such as the rate of change of curricula, the type of change, the speed of implementation, student demographics (including student disabilities), culture both from a macro sense (city wide) right down to a micro sense (what's happening in a single school or classroom), leadership, respect, teacher attrition, teacher attitudes, collegiality, teacher demographics, teacher experiences, school funding and resources, leadership, and many more.

There is one area that I am not really exploring, and that is mental health issues. It was discussed briefly in some of the vignettes, but this is an enormous issue that impacts on hundreds, maybe thousands of classrooms every day. Many students with mental health issues

are not getting the help and support that they need, and as a consequence, teachers, often with little or no experience or support in this area are dealing with these students in the 'least restrictive environment'[1] as best they can, often adding to an already stressful environment.

This work is primarily narrative, and as such, the use of present tense is helps bring the story to life. Normally in a work such as this, the author would start out with broad ideas and then zoom in on a specific area. With emergent, authentic participatory research such as this, I felt that it was important to bring a number of ideas together to give the reader a real feel for the challenges and successes that teachers in an urban setting experience. Even so, what I am writing is not necessarily generalizable or typical, but is specific to the people and experiences that I have had since my work began in July 2003. It should be noted however that in authentic inquiry, theoretical generalizability might be possible. This idea is at the heart of authentic inquiry which is by nature polysemic. It is the differences between people that allow us to understand. This research is not dealing with uniformity and conformity, but with difference and non-conformity.

Mitch Bleier (2018) raised this very issue when he was in the midst of the IRB approval process. He was asked how he could produce statistical generalizability with an n of 1. Mitch was doing authentic inquiry and wasn't interested in statistical generalizability. He referred to Margaret Eisenhart (2009), who pointed out that research on small samples is entirely consistent with claims that theoretical generalizability in social science research can provide a "refined understanding of a generic process." Eisenhart notes earlier claims by a number of eminent researchers such as Guba and Lincoln and Harry Wolcott that you do not generalize from a qualitative study. In each case however, these researchers did leave the door open to different forms of generalization. For example, most teachers find evaluation stressful and unfair.

Evaluations are partly based on student performance. Teachers of special needs students often see only small improvements in their students' performances. While these improvements are important, the students have not reached 'the standard' and the teacher is given a low rating. We could therefore theorize that teacher evaluations are stressful on all teachers but the actual impact varies from teacher to teacher.

In city schools, there are a number of factors that contribute to school culture and that mediate the actions and reactions of all involved. All teachers are evaluated in a process that includes observations. Every teacher will react differently depending on their own experience and their relationship with the evaluator. The insistence by schools on a particular way of delivering curricula can engender some very creative ways to still use their own methods in the classroom. Thus the theoretical generalization could be that teachers in each school develop ways that circumvent or accommodate impositions that would otherwise limit their professional freedom. I spoke to a teacher a few days ago about her experiences with teacher observations. This teacher is probably one of the most positive people I have ever met. She loves her work and is full of bright ideas. When I asked her about evaluations she just shrugged her shoulders and said that she does what she knows has to be done, but also gives her principal what he asks for. Observations in this case are cursory and of little value to her.

It is important to note that throughout this work, the many vignettes are not necessarily each about a single person. In some cases they are about one person, but often they are a composite picture of my experiences over time with a number of people. I want people who read this, to experience the world of teaching in an urban setting. This world, despite its many down sides, also has moments of great beauty that you see in a fleeting look, or a smile on a child's face when they make sense of an idea. Some experiences are so real to me that they have to be told.

One vignette demonstrated the power of a supportive and loving family, and of teachers who cared for a female student, to the extent that this particular student really had two families. The story describing the student's struggle through massive physical and intellectual disabilities should be an inspiration to all of us, and a testament to the good work done by our teachers.

My work in schools is supposed to be with teachers, not with students. I do however make a point of helping teachers look out for those students who are troubled, left out, struggling, or any other thing that brings them to our attention. Supporting a teacher in her/his work cannot be separated from the community and the environment in which that work takes place. The (crypto) positivists would have us believe that you can isolate variables and manipulate them in that isolation. Sometimes the ice is broken when someone just takes the time to listen. They too have their story to tell, and sometimes just need someone to give them a chance to tell it.

CHAPTER 0 – SETTING THE SCENE

WHAT IS RESEARCH?

When I think about this question a number of ideas spring to mind. We might imagine searching for a miracle cancer cure or working on dig sites. We might consider taking a data set such as the National Education Longitudinal Study and crunching it into some analytical software program such as the Statistical Package for the Social Sciences.

Research could be a discovery of yourself, of putting into words who you really are. It could be a discovery of your own country, like John Steinbeck's (1961) book Travels with Charlie, where he leaves the comforts and familiarity that have surrounded him for so long, and travels around America with his dog Charlie, revealing in his writing, insights into his ontologies and his axiologies on an emergent journey through other lives and other places.

My ideas about research have changed a lot since I first took Logics of Inquiry in 2010 with Kenneth Tobin. Research is not just about collecting a bunch of convenient data that support your hypothesis. While my overarching research methodology is multilogical in that it uses multiple perspectives, lenses, meanings and voices, an important focus is hermeneutic phenomenology - making sense of what is happening, building understanding, and adjusting our thinking whilst being mindful of others in the field (Fellner, 2013). Research is about asking what else there is. It is about using radical listening, cogenerative dialogues, ensuring alignment with the idea of beneficence (fully explained in the Belmont report, 1977), and Egon Guba and Yvonna Lincoln's authenticity criteria (1989).

Since my arrival in New York in July 2003, there have been a number of significant changes to the state mathematics curriculum. These culminated in the implementation of the Common

Core Learning Standards (CCLS). Even though there have been some improvements in terms of the graduation rate, and a reduction in the dropout rate, I know from my direct interaction with many students and teachers, that a significant proportion of students still struggle with thinking mathematically, problem solving, and even basic numeracy. The CCLS has set challenging standards for students and teachers, but instead of introducing the standards beginning at the elementary level and then phasing them in year by year, the whole implementation was done in just a few years. There has been a lack of acknowledgement of individual differences between students. Whatever the reason for introducing all grade levels at almost the same time, students already struggling with the old curriculum now have an even more challenging task of operating at a higher level without the advantage of elementary and middle school preparation in the new standards.

Something that I am struggling with is the idea that has been dominant in New York for many years. If we find a great curriculum, we can prepare all of our students for college and career. This mindset does not in any way cater to the extremely diverse population of students. Mitch Bleier (2018), a colleague from the Graduate Center, wrote in his dissertation abstract that;

> the most common approach to educating the populace places learners in contrived, curriculum centered learning environments that are characterized by uniformity, standardization, and incessant high stakes testing…and that… this set of circumstances tends to marginalize learners whose particular needs…locate them far from what can be considered as a representative student.

What Mitch goes on to say, is that not only do we fail to cater to a diverse population, we often don't appreciate the knowledge, skills, and life experiences that students bring with them. It

seems to be more about just delivering a set curriculum, without taking into account the individual differences.

This research develops a sense of what is happening in NYC schools, and uses this understanding to reevaluate how we, as consultants, coaches, researchers, and teachers, can make school the sort of place that caters to and embraces difference, and that values teachers as professionals and colleagues. This is done primarily through the eyes of two teachers who I had the pleasure of working with for a number of years as a consultant/coach.

PROBLEMS OF PRACTICE[2]

Teachers face many problems of practice. One of these problems includes the issue of remediation. Beliefs on remediation for students are changing rapidly. Recently CUNY revised its policy on remediation based on the knowledge that remedial courses are generally unsuccessful (Thompson and Rabinowitz, 2018). At the college level, remedial courses are costly, non-credit bearing and rarely provide a pathway to future success.

The practice of offering remedial courses at the secondary level is entrenched in the school community and it is only now that colleges are setting the pace, the schools are beginning to see that alternatives are required for students seen to be falling behind.

This issue was raised recently in an article by William Thompson Jr. (City University of New York Board of Trustees chairperson) and Vita Rabinowitz (the Interim Chancellor of CUNY), in the Education Dive online newsletter (2018). They note that…

> …the courses are often unnecessary. Students who could succeed at credit-bearing coursework with the appropriate supports are placed in remedial programs on the basis of standardized tests of dubious predictive value. Indeed, a major study found that as many as 29% of students who tested into English remediation could have

earned a B or better in a credit-bearing course — without the benefit of any remedial help.

COACHING AS A PATHWAY TO SUCCESS

Coaching is about communicating, sharing, listening, learning, building relationships, being accepted, getting to know people, purposely selecting subjects to work with, accepting that data will often send us on divergent pathways, comparing, interpreting, consoling, adjusting, compromising, reading, and understanding. Coaching/consulting is about diplomacy and seeing all sides to an argument. Coaching is about putting yourself in the teachers' shoes, talking to people and taking risks, immersing yourself in the work of teachers, talking to students, looking for solutions, and being aware that not everyone will see things your way. Coaching is about understanding the special relationship that teachers have with their students, and respecting that. Coaching is also about understanding the way teachers are evaluated, the competing demands and expectations of administrators, and evolving as a coach. The coach is a learner as well as a teacher, and a partner in the greater enterprise.

IT'S OK TO THINK DIFFERENTLY

One of the methods used throughout my research is known as cogenerative dialogue, or cogen. Cogen is a strategy developed by Tobin and Roth (2004) to bring about more equitable interactions among participants. Cogenerative dialogue is used as a way for participants to understand each other's standpoints and consequently their epistemologies, ontologies, and axiologies. It is where shared experiences are used to construct local theory with the intention of improving learning of students. In cogen, learning communities develop a praxeology rather than just observation-based theories. (Praxis is the process by which a theory, lesson, or skill is enacted, practiced, embodied, or realized).

Cogen is very much a dialectical interaction in that it involves two or more people with sometimes different or even opposing views searching for better understanding of an issue or topic through reasoned argument. It has some similarities to the practices of the Vygotsky Circle which was formed around 1924 in Moscow after Vygotsky moved there from Belarus. Anna Stetsenko (2004) discusses the collective and collaborative nature of the Vygotsky Circle;

> Vygotsky wrote *Tool and Sign* in close collaboration and in lively discussions with a number of people… They formed the so-called Vygotsky Circle, which included several brilliant women, and they carried out research projects collectively. It is quite revealing, in this respect, that even the authorship of Tool and Sign is disputed; there is some reason to believe that Vygotsky wrote it together with Luria… Whatever the case of the authorship of this particular work, the ubiquitously collaborative nature of Vygotsky's project in general must be emphasized, especially because it has often been underestimated or even ignored in previous accounts of his heritage (p. 502 - 503).

In this study, most of the data are based on cogenerative dialogues between the PI and the participating teachers. Data also come from the researcher's experiences as a consultant /coach in New York City public schools. Ultimately, we developed a local praxis based on these cogens.

RESPECT, BENEFICENCE, AND JUSTICE

The equity of benefits as experienced by researchers, participants, and others are evaluated with reference to Guba and Lincoln's (1989) authenticity criteria such that researchers adjust their ontologies as a result of the research, the research is educative, catalyzes change, and benefits all members of the community. My own practice as a researcher was heavily influenced by the authenticity criteria. The word adjust was used because participants were not asked the abandon their beliefs and practices, but just to be aware of and understand where others are coming from,

and build this in to their own understandings. The educative component follows from this. Once we understand others' ideas and standpoints, we can make better choices.

The study also is aligned to the Belmont report in that it will respect people, demonstrate beneficence (will not harm whilst giving maximum possible benefits), and demonstrate justice in the sense of fairness, individual contribution, and benefit to each participant according to need.

In this critical study there is not a particular outcome that I am intending to prove. In the tradition of hermeneutic phenomenology, I work to understand what is happening. I consider all data using multiple methods and consider all viewpoints and I am cognizant of my own and others' subjectivities. Participant selection is serial and contingent rather than random. This study does not use reductionist methods, nor does it support a positivist stance. Like Tobin and Kincheloe (2009), I am opposed to test driven educational reforms that standardize pedagogy and curriculum in ways that de-professionalize teaching and exclude diverse approaches that challenge the status quo.

IT'S GOOD TO BE DIFFERENT!

The data for this study are sourced from my experiences as a consultant/coach over a period of about 15 years. Sometimes the data are an amalgam of my experiences, and sometimes the data are from a specific person. While there are many teachers referred to in this research, most of the data come from cogens and my observations of two teachers. These teachers were selected serially, and contingently, but their selection did not require that their ontologies, epistemologies, or axiologies were aligned with mine. In fact, they were chosen specifically because of my commitment to learning from difference.

I anticipate that this research will help all participants better understand and make sense of the work and challenges that arose as they did their work, and that praxis, beliefs, and

understandings have changed as a result of their interaction with the research / researcher, and that all participants saw new ways forward in this most challenging of professions.

CHAPTER 1 THE JIGSAW OF AUTHENTIC RESEARCH

Research is literally that - an unending process of searching. The scientist [or researcher] arrives not at some final answer, but a deeper set of questions. There's always a bit further to go, a bit more to learn... Montgomery Fate (2009, p. 167)

A man should look for what is, and not for what he thinks should be. (Albert Einstein)

LOOKING AHEAD

In the preceding pages I discussed the important question "What is research?" and laid the foundations for Chapter 1. I briefly discuss the concept of problems of practice and introduced the idea that it is OK to think differently. I outline the important ideas of respect, beneficence, and justice as explained in the Belmont Report. What I do in this chapter is to paint a picture of the job and components of the job of being an urban mathematics teacher, as well as explain the things that I value in research – such as difference and subjectivity, so that readers are clear about my own axiologies and ontologies from the start.

Chapter 1 is a mixed bag of theory and practice. It is a glimpse of what is to follow and moves from research to some of the hurdles that arise in doing the research. I examine the curriculum (and with it a brief history of the curriculum) and its impact on the job mathematics teachers in an urban school have to do. I discuss how schools are managed including how teachers are evaluated and valued and consider why schools are managed the way that they are. Throughout this research we visit and revisit important historical events and consider their impact on contemporary mathematics teaching. The chapter also examines important ideas such as teacher attrition, communication, special education, downsizing the schools, pathways, and the impact of policy both past and present on the job mathematics teachers have to do.

I also broadly outline many of the topics, theories, and components of the research to follow. By understanding what has gone before, we can better see why certain cultures exist, why only certain pathways are offered, and why only some career paths are valued. It is important to understand some of the challenges that teachers in urban schools face and begin to think about how those challenges can be addressed. Chapter 1 also introduces important methods such as cogenerative dialogue and radical listening, and sets the scene for the regular use of these important tools in accepting, understanding, and adapting when differences not only present challenges but also rewards and benefits as we all learn from each other. It further introduces the important issues of diversity and the impacts of positivism. I explore and discuss each of these topics in later chapters as they arise.

Following my introduction to the Belmont Report, I share my experience with the Institutional Review Board as a way of better understanding the importance of the three tenets in the report. These include;

> Respect for Persons - the requirement to acknowledge autonomy and the requirement to protect those with diminished autonomy.
>
> Beneficence - Persons are treated in an ethical manner not only by respecting their decisions and protecting them from harm, but also by making efforts to secure their well-being.
>
> Justice - (1) to each person an equal share, (2) to each person according to individual need, (3) to each person according to individual effort, (4) to each person according to societal contribution, and (5) to each person according to merit (Belmont Report, 1979).

Finally, I examine the idea of emergent research and introduce the authenticity criteria. I discuss what makes this research emergent and why this is important in authentic inquiry. The historical notes that follow focus on aspects that are salient to this research.

A BRIEF HISTORICAL BACKDROP TO PUBLIC EDUCATION POLICY IN NYC

In the early days of public education in New York City, teachers were generally well respected. This was particularly so in the decades around the turn of the century when hundreds of thousands of immigrant Eastern European Jewish children entered the public schools of New York City. Now the goals for these students were initially English literacy, acculturation, and socio-economic stratification. The actual outcomes were somewhat different however due to the nature of the curriculum, which was based on American ideals but little attention was paid to Judaism, Jewish history and culture. Teachers at this time were highly respected, not only by the students, who saw them as role models, but by the Jewish leadership (Brumberg, 1984, Abstract).

This respect for teachers was soon doomed by the adoption of the principles of scientific management, the brainchild of Frederick W. Taylor. Scientific management was a process that was originally applied in industry (hence the term factory model is often used to describe to this process).

Scientific management in industry involved time and motion studies after which employees were allocated a single repetitive task to be accomplished in the one way that had been determined to be the most efficient. This model was economically successful and was adopted by many companies whereby 'production lines' produced a consistent and efficient output. The problem with this model was that it isolated the employees who in many cases had no vision of the final output of their work. Managers and owners were easily able to quantify the outputs and make adjustments where necessary. This system stripped workers of any initiative and reduced their day to repetitive mind-numbing processes.

The urban education system in New York City was at the time seeing a huge influx of immigrants, but it was considered to be running inefficiently. Reformers saw an opportunity to demand more accountability, transparency, and efficiency in education (Ireh, 2016). Many people jumped on the wagon including John F. Bobbit who strongly supported the implementation of scientific management in US schools. Bobbit proposed a curriculum that shaped students into adult workers and asserted that good outcomes required "precise top down instruction for all tasks performed." (Ireh, 2016, p.6).

Bobbit (1913) quoted in Ireh (2016, p7) said that teachers must be required to follow the methods determined by their administrators because they are not capable of determining such methods themselves.

Today we still see many embedded practices that are based on the principles of scientific management. These include the top down management style, measurable outcomes, standardized processes, test based effectiveness, and a distinct lack of collegiality. Teachers even today are often seen as needing to be controlled and of not being capable of making judgments and decisions without being directed to do so.

It should be noted that despite a considerable body of support for the scientific management system in education, that not everyone supported it. Not least was John Dewey, whose philosophy and central imperative in education was democracy. Dewey offered progressive based alternatives[3], but was not heeded and scientific management won the day.

I came from a system in Australia where collegiality was embedded. I always felt valued and was supported even when I made a mistake. When I came to New York City I sensed a very different culture in the schools where I worked. It felt like teachers were not masters of their destiny, but were treated as if they were incapable of making good decisions and needed regular

supervision. Is it possible that despite more than a century since Taylorism was imposed on public schools in the United States, and despite the never-ending changes that have been made in terms of policy and curriculum, that the factory model is alive and well?

Another model that has survived intact in some areas was that of Johan Herbart (1776-1841), a German philosopher whose pedagogical theories were disseminated through quarterly journals during his lifetime and following his death (Pulliam and Patten, 1994).

> Herbart's followers in America used his insistence upon association and interests to develop a very rigid educational program. This program came to be known as the Five Formal Steps of Teaching and Learning. They were: (1) preparation, in which old ideas useful in learning new materials are called to the learner's mind; (2) presentation, or the actual giving of the new material; (3) association, in which new material is compared with and related to the old; (4) generalization, in which rules, definitions, or general principles are drawn from specific cases; and (5) application, in which general principles are given meaning by reference to specific examples and practical situations (Pulliam & Patten, 1994, p. 103).

A possible reason that this model was so successful was that most secondary school teachers in New York and throughout the United States were not formally educated with university credentials. This meant that educators and school administrators were often left to their own devices in terms of discovering and learning about pedagogies (Watson, 2010).

> The Herbartian influence dominated American education in the 1890s and can still be observed in many mathematics classrooms, where instruction often begins with a "Do Now" that is followed by a presentation of new materials, which are modeled and explained for students, after which the students are expected to solve specific problem sets in which the new concepts are embedded. The Herbartian approach was particularly well suited to delivering the canonical texts associated with classical humanism, but was not universally embraced by more progressive educators. (Watson, 2010, p. 81).

The Revolving Door - Let's Blame the Curriculum

The introduction of the new Common Core State standards in 2013 has seen New York's most comprehensive change in education ever. Previous changes were just at the high school or middle school level, or just involved curriculum. Sometimes the changes were limited to New York State or New York City. The Common Core Standards[4] involve a change in the way we think about mathematics instruction. Previous curricula involved a number of discrete topics that were highly compressed and there was little opportunity for students to make sense of the work. The idea behind the Common Core was that mathematics is connected, contextual, and nuanced.

If we are going to get any value from the learning we need to include the sense making part of the mathematics and connect what we are learning to other topics and strands. We also need to understand that the real meaning of mathematics depends on the context in which it is applied. Even simple concepts like multiplication and division can mean very different things depending on their particular context. The Common Core also advocates an approach to learning that has been supported by the National Council of Teachers of Mathematics for years. The path to learning and solving problems involves sense making, and from this understanding, developing or using an appropriate procedure (or if you like, procedural fluency). The Common Core State Standards were developed because there were considerable differences between states in terms of content and level. As a result of different educational standards between states, students graduating at the same time in different states could have very different levels of knowledge.

There was considerable support across the country for the idea of a "Common Core" but the manner and speed of the implementation caused a great deal of concern. Many of the Common Core mathematics standards are based on the standards advocated by the National Council of

Teachers of Mathematics as well as inputs from a wide cross section of professionals and academics.

The claim of the Common Core is that it prepares students for college and career. While the Common Core does move us closer to better classroom practice, it does not address my earlier concerns about diversity. In fact, in can actually now be harder for some students to meet the required standard. Many of the tasks students are required to do are considerably more challenging for those whose first language is not English or for those whose English language skills are not meeting the required standard. It does not provide multiple pathways for students who are at different stages of their educational development, nor does it cater to students hoping to work in trades or non-academic professions. The idea that every student should go to college by following a single pathway is not catering to the needs of society. We have an incredibly diverse student population who are at different stages of readiness, and who would welcome more choices in available pathways to achieve their desired qualification. There is currently a worldview that becoming a tradesperson is undesirable, and that the only acceptable option is to go to college. For many students, this is not a good fit, not that they couldn't do it, but that they are not seeing college as a desirable option at this time.

Students in urban schools already face significant hurdles. The new curriculum is considerably more challenging than anything students have experienced in the past. Teachers are required to have a significant understanding of these new curricula such that they are able to make appropriate instructional decisions. It is important to understand that when the standards were first adopted and new curriculum was introduced, teachers were sometimes required to teach to them without ever having seen the new curricula. For many, the materials were not even delivered to the schools until well into the school year. Further, PD for teachers around the new

curricula was often a packaged, one-size-fits-all affair that was either provided by publishers or by administrators or other teachers who were turn keying after only minimal experience with these fundamental shifts in how teaching was to occur.

Teaching mathematics under the new Common Core State standards involves major instructional shifts. (Engage NY, 2012). These shifts involve reducing the amount of content and building depth of understanding into each topic and concept. Teachers have the challenging job of bridging the enormous gaps between the old curriculum and the new. They are required to design/find assessments that not just assess the students' abilities to reproduce a demonstrated algorithm, but also demonstrate that students understand the mathematics contained in the problem. Students have to learn concepts and skills, make connections, and apply this knowledge to complex problems so that they demonstrate significant understanding of the problem as well as appropriate mathematical approaches that could be used to solve the problem.

Students should demonstrate speed and accuracy with simple calculations. They must know how to do basic single digit calculations quickly and accurately. They also have to understand the relationships such as we see between fractions, percentages and decimals. It is also important that they know how to measure, how to be proportional thinkers, and how to use appropriate units. They need to apply knowledge in different situations and not just reproduce a standard procedure.

Up until June 2014, high school students who had completed the Integrated Algebra course at the end of grade nine were then required to attempt the Integrated Algebra Regents exams. These exams have four parts. Part one includes thirty multiple choice questions. Parts two, three, and four, require students to produce a constructed response. Essentially, this means that they have to make the thinking that they use clear. Students' responses in parts two, three, and four,

consistently demonstrate that most students have difficulty with questions that involve more than a basic algorithm.

Despite many teachers' best efforts and improving graduation rates, urban high school students' performance in constructed response (e.g., questions other than multiple choice) remains abysmal[5]. The introduction of the Common Core State Standards as previously mentioned, whilst providing an opportunity for more challenging materials, more demanding mathematics, and a greater requirement for student understanding than ever before, will require the use of skills not yet attained by many of our new middle school and high school students. The method of introduction of the Common Core State Standards was such that in grades K to 12 they were implemented almost simultaneously. Instead of a year by year implementation beginning at kindergarten and then phasing in the use of annual increments, the new standards have been thrust upon schools all at once. Some aspects of work previously done in grade nine mathematics are now being seen as early as grade six or seven. Is this a positive or a negative step? It would seem that the answer varies depending on a number of factors including the individual student's background, and the teacher. The National Council of Teachers of Mathematics (NCTM) argued that problem solving should become the focus of mathematics in school (Lubienski, 2000). Such an approach can motivate all students to learn key concepts and skills in context. It would seem that doing more challenging work could be effective if it is learned in a sense making, problem solving environment.

WHAT EXACTLY ARE WE EVALUATING?

How can teachers whose students were previously struggling with easier and less demanding content raise the bar even higher to meet this new challenge? To throw another item into the mix, the new teacher assessment program written by Charlotte Danielson was implemented

concurrently with the new standards. (The Danielson program was originally meant as a reflective document for teachers to use). Nearly all teacher participants in this study expressed serious concerns about teacher evaluations.

Teacher evaluations reflect the dominant hegemony and are employed within a positivistic framework. The evaluations use a series of rubrics written by one person, all linked to student test scores that bring up once again, the debate on growth versus proficiency. While the figures for teacher attrition demonstrate cause for serious concern, the exact reasons for this high turnover are unclear. My experience in working with teachers is that teacher initiative can be suppressed because teachers are worried about using ideas that do not conform to the current worldview. The real concern is why so many new teachers quit by the end of the second year of teaching, and that almost half of all teachers quit within seven years. (UFT Research Dept. 2010). The following table from the UFT analysis of payroll data helps us see the magnitude of teacher attrition.

Figure 1 Attrition of New Teachers NYC 2002 2009

Year Hired Totals	% quit by Year one	% quit by Year two	% quit by Year three	% quit by Year four	% quit by Year five	% quit by Year six	% quit by Year seven
2002 – 2003 7,882	14.2	24.5	33.1	39.9	44.6	47.9	49.9
2003 – 2004 8,234	11.3	23.3	32.2	38.6	42.9	45.3	
2004 – 2005 7,882	11.9	22.9	32.8	38.7	42.0		
2005 – 2006 7,882	10.9	24.1	35.6	37.9			
2006 – 2007 7,882	11.9	24.0	31.2				
2007 – 2008 7,882	11.5	21.0					
2008 – 2009 7,882	11.6						

Source: UFT analysis of payroll data

WHERE ARE WE GOING WITH THIS?

It is the goal of this research to implement the authenticity criteria as delineated by Guba and Lincoln (1989) using cogenerative dialogue[6] and radical listening, under the umbrella of interpretive social (naturalist) research. This research is strongly guided by the work and theories espoused by Guba and Lincoln (1985) in their book *Naturalist Inquiry*. The approach is emergent in nature and coordinates research strengths such as the acknowledgment of bias, recognition of subjectivity, and celebration of difference.

The driving force behind this study is that we should not just be describing the misery of others. Instead it is my intention that this research should give us the knowledge and means to intervene to improve the quality of the social life of all participants, in particular - the teachers who face the challenges of teaching every day. It is my hope that through the media of cogenerative dialogue and tools such as radical listening, a new praxis will result because of the efforts of all participants and as a result of their willingness to rethink their ontologies, axiologies, and epistemologies. Such a philosophy is captured in Paulo Freire's (1998) Educational Theory. While this quote is talking about students, it can certainly apply to teachers in this context.

> Our relationship with the learners demands that we respect them and demands equally that we be aware of the concrete conditions of their world, the conditions that shape them. To try to know the reality that our students live is a task that the educational practice imposes on us: Without this, we have no access to the way they think, so only with great difficulty can we perceive what and how they know (p. 58).

My research is also aligned with Anthony Giddens' (1984) idea that questions do not need a generalization[7] to answer them… and that… the social science observer does not have a fact to

discover. This perspective alludes to the divergent path that can appear when embracing the multitude of data types, ranges, voices, and meanings that this type of research will uncover.

ANOTHER HURDLE TO OVERCOME – THE INSTITUTIONAL REVIEW BOARD

The New York Times (November 26, 2018) reported that;

> A Chinese researcher, Dr. He Jiankui, said that he had altered a gene in some embryos, before having them implanted in a woman's womb, with the goal of making the babies resistant to infection with H.I.V. He has not published the research in any journal and did not share any evidence or data that definitively proved he had done it.

The potential for harm here is unknown, but the article does go on to say that altering one gene may have an impact on other genes as it is known that genes rarely work in isolation. It seems that in the rush to be first, this researcher has completely bypassed any sort of process to ensure that participants (in this case the babies), are not harmed.

This case highlights the critical role of the Institutional Review Board (IRB), which is to protect human subjects by ensuring that all research involving human subjects is conducted ethically and in such a way that no, or only minimal harm comes to research participants. (Bleier, in publication). The Belmont Report (1979) says that research involving human subjects must adhere to three basic ethical principles: respect for persons; beneficence; and justice. The process of obtaining IRB[8] approval can be challenging and stressful. My own experience was challenging but once it was underway, not as bad as expected. Every Tuesday night a bunch of Urban Education PhD students get together for a few hours to review each other's work and work through issues and problems. The support from squad was invaluable in preparing me for the process. There is also a considerable number of supporting documents available of the Graduate Center website. Any inquiries that I made were responded to quickly and efficiently.

The main challenge was a clash in methodologies. Many of the people involved in the approval process, although well intentioned, struggle with the philosophy and methodologies behind authentic inquiry. Some of these clashes are exemplified in the following vignette. As mentioned earlier, present tense is used in this vignette to bring the story to life.

The Struggle to Stay on Track

Having passed my second exam, the prospect that I might actually complete my PhD studies in Urban Education now seemed within reach. Three years of coursework had come to an end. Yes! The daunting prospect of doing my dissertation loomed but as usual, those three years of coursework meant that many of my other projects had been put on the backburner. Expectations were high at home that all of those things that had been pushed aside while I studied, were now well and truly in sharp focus on my to do list.

A year went by, and then another, and another. The light at the end of the tunnel was getting more distant than ever. Slowly I clawed my way back into focus, and surveyed the looming tasks ahead. The fear of the dissertation was really the fear of the one major hurdle that we all have to face sooner or later the IRB. The IRB was, in my mind anyway, like a mountain to be climbed, or a huge bill to be paid. I was now at the point where I could go no further until I had done the IRB. The IRB gets a bad rap. Sometimes it deserves it, sometimes not. I know that after years of horror stories I was preparing for the worst.

As a former mathematics teacher, I pride myself on my problem-solving abilities. I set to it, set up my online account with IDEATE CUNY and began my initial application. The web site, although initially a bit confusing, started to make sense. I began to answer the questions and within a few days had a response for them all. I was feeling pretty pleased with myself and so clicked the submit button. I watched the little wheel spin for what seemed like forever, and it was

done. The IRB application is a very literal document. By this I mean that you must give the IRB exact answers. Include nothing more, and nothing less than what you are asked for.

The IRB in your university performs a very important function. The board is there to ensure that all research involving humans is conducted ethically and to minimize harm to people involved in the research. The ideas of respect, beneficence, and justice were given voice in the late 70s with the release of the Belmont Report (1979). There are many examples of the flagrant disregard for people, particularly during times of war. It is often the most vulnerable members of our population – children, the elderly, prisoners, and others who are less able to defend themselves against unscrupulous or careless researchers and experimenters, that we need to protect. But really, if we expect people to participate in research, they deserve to be treated respectfully.

A few weeks passed by and suddenly the reply was there. It is almost impossible to read in situ so I copied it into a Word document. I scanned an enormous to do list, counting no less than 27 items requiring my attention. As I read through the pages of correction that were required, I couldn't help but be just a little thankful to the reviewer (who I am pretty sure doesn't get paid), for the clear, concise, instructions. Links were provided where necessary to appropriate websites, and patiently, line by line, I was set straight. All I had to do was to go through it one point at a time, and follow the prompts.

My second submission came back to me with nine recommendations, including a warning about the number of participants. BE SURE NOT TO UNDERESTIMATE was the stern admonition after I indicated that there were going to be a maximum of four participants including myself. This was a little ominous given the problem that we have had with authentic

inquiry applications in the recent past. I think however, that the trail has been blazed and future applicants can probably expect a smoother ride through the process.

Let's be positive – 9 issues to be addressed is considerably better than 27. As I read through the 9 issues to be addressed, my heart sank. In its current form, I would not only need an IRB approval from the Graduate Center, but one from the New York City Department of Education. I am not prone to depression but I began to get a sense of what it must be like! The good thing about having an advisor like Ken Tobin, is that you always walk out of his office feeling better than when you walked in. Within 24 hours of our meeting, I had re submitted my application and this time…

Yesterday I received back the response to my third attempt at getting IRB approval. It was with some excitement that I began to read the recommendations, but the excitement quickly turned to disappointment. There were nine more changes required. Most of them were relatively minor but the first one really highlights the problem that researchers using authentic inquiry face. I had explained in my previous response that as a participant researcher, I would include myself in the number of participants. I consequently increased the number of participants from 3 to 4. The response from the reviewer…

> Research Design/Overview/Research Design and Methodology: You state: "as this is participant research, the researcher is also a participant. The maximum number of participants will therefore be four." Note that the PI is not to be counted as a research subject. Please revise to solely address the subjects you will seek to recruit. Ensure consistency in revising this field, and the Participants/Eligibility, and Participants/Projected Enrollment tabs. If you may enroll more than three subjects if interest is greater than currently expected, then it is strongly advised to increase the target enrollment to avoid future non-compliance due to over enrollment.

The key comment of course, “Note that the PI is not to be counted as a research subject” pretty much says it all. I am not studying subjects, I am dealing with people. I am a participant researcher and so I am one of the participants. I should be counted as my being there impacts the research. I am involved and my actions do impact on the outcomes. However I decided to make the change as recommended because such a change would make no substantive difference to the conduct of the research.

Response #4 from the IRB just came in while I was sitting here! I copied the text of the message into Word again and took a look. There were six more things to change, but each one of them very straight forward. Less than an hour later I was able to resubmit. I think I am there at last! There are many other details that I could include such as the naming of files that can hold you up if you’re not aware of the rules, but really gaining approval is just a matter of carefully reading the instructions.

I have a final word. Can the IRB process be challenging? Yes it can. Is it doable? Yes it is. Am I glad that it is almost done? Absolutely. The things that really helped me were the encouragement and great ideas from my colleagues in the research squad at the Graduate Center. Mitch, Ivonne, Karim, Elizabeth, Manny, Amy, and of course Ken. Thanks guys!

P.S. Yesterday Sept 13, I received my approval letter!! Now the hard work begins!

HUMBLE BEGINNINGS MY PLACE IN THE FIELDWORK

Before becoming a mathematics consultant in New York City in July 2003, I was a high school mathematics teacher in Queensland, Australia. My school was a semi-rural, mono cultural (mainly white, middlish class) school. I also had little experience with non-English speaking students. Most students could understand me, and most students were reasonably competent with basic numeracy (i.e., single digit operations). Australian schools often have trees and grass,

where students can go outside for their morning tea and lunch breaks. Parent teacher night at my school in Queensland involved about 90% of parents taking part. This was a great opportunity to include the parents in the discussion about teaching and learning, and to better get to know things about these families. Our schools were open and welcoming.

I initially had very little understanding of the complexities of large, diverse, multicultural student populations. I also was unfamiliar with classroom culture in New York City, and I did not understand the management culture in city schools. My knowledge was limited to discussions with other consultants. In contrast to my teaching days in Australia, my first school in the South Bronx felt like a prison. Students rarely left the large square building. Entry involves a slow and demeaning process of lining up and going through a metal detector controlled by school safety agents in police uniforms[9]. Parent teacher night in the South Bronx sees less than 10% of parents attending. Student attendance in NYC schools can be very low – sometimes as low as 60%, although some schools have made great progress in this area.

It took a long time to adjust. I remember a day shortly after I first started when I sat in my car outside the school trying to work up the courage to go inside. Not that people weren't nice, they generally were. It was just me trying to wrap my head around a system that was more different than I could have imagined.

About eighteen months ago I began work with the CUNY Research Foundation as a math instructional specialist in a program called LINCT. The LINCT (Lessons in Navigating College Transitions) program is part of the CUNY K-16 Initiatives and is designed for students who are on track to graduate but struggle in mathematics and will probably end up in remedial noncredit bearing courses if there is no intervention. The work was only one or two days per week, but was a breath of fresh air. It gave me an opportunity to work side by side with people like me and to

learn from them. I felt like I was revitalized with new ideas and experiences. I am also fortunate to have the opportunity to not only work in different schools, but also with different organizations. Such work gives me even greater exposure to a range of ideas and approaches.

Charting a Course

My interests are to use my understanding of the challenges and successes that teachers face when trying to address the needs of all students. I am interested in using my own experiences to get people talking respectfully to each other and in learning how to embrace diversity and to be a part of this rich school community. I want to know why so many good people leave the system early, and why many of those who stay become burnt out. In line with the nature of this research, the areas of focus will become clearer as things progress. Finally, I would like to better understand what it is like to teach in an urban setting through the eyes of people who know.

As a high school mathematics instructional specialist for CUNY, and a mathematics education consultant, my daily work guarantees regular access to classrooms. I regularly have the opportunity to go into classrooms and watch/work with teachers and students. Some days I have the chance to coteach. I often have a chance for informal conversations and getting to know people better. I always offer to take part in the lesson, and to model some of the things that I advocate in our meetings. Initially teachers are a bit wary, and students wonder who I am, but usually within a few days, my presence is no longer an issue. As mentioned earlier, my Australian accent sometimes gets a few giggles, and the usual suspects try to imitate me, but it also highlights how curious the kids are. They often want to ask me questions about Australia. They are very curious about our unique fauna, and very open to a few exaggerated stories. It highlights how far it really is from the South Bronx to rural Queensland.

Data, Data Everywhere…

Data will come from a number of sources but cogenerative dialogues with teachers, retired teachers, and other participants are my primary sources. I am also using my experiences as a mathematics education consultant since 2003. Dialogues are sometimes audio recorded and if required, will be analyzed at a later time. Other sources include dialogue with teachers and students, student work, interactions with students, meetings with principals, and discussions with other consultants.

Let's Blame the Curriculum

The mathematics curriculum has seen considerable and ongoing change since public schools first opened. Mathematics instruction in the period 1900 – 1930 was basically just drill and practice. This was the predominant instructional model employed by mathematics teachers. This period also coincided with the adoption of the scientific management model advocated by F. W. Taylor. The next 3 decades were Meaningful Arithmetic (1930-1958). Meaningful arithmetic was an important step forward and in many ways set the tone for modern mathematics teaching. This period also included the post war Life Adjustment period where education's principal role was the adjustment of students to the social world in which they lived. It was however a huge step forward from the drill and practice period that preceded it.

Eads (1955, p.144) said that…

> Often, when insight came to a teacher, it came suddenly. The day a teacher appreciated how understanding differed from rote verbalization was a rewarding day for both that teacher and her supervisor. Usually these teachers began then and there to help other teachers "understand too."

The next period was the New Math period (1958 – 1975). It began in the age of Sputnik and increasingly sophisticated technological systems and machines. It was considered to be the reform period because of the huge amount of curriculum development happening during this period.

David Klein (2003) with respect to the new math period noted that…

> …one of the contributions of the New Math movement was the introduction of calculus courses at the high school level. Although, there were important successes in the New Math period, some of the New Math curricula were excessively formal, with little attention to basic skills or to applications of mathematics. Programs that included treatments of number bases other than base ten, as well as relatively heavy emphases on set theory, or more exotic topics, tended to confuse and alienate even the most sympathetic parents of school children. There were instances in which abstractness for its own sake was overemphasized to the point of absurdity. Many teachers were not well equipped to deal with the demanding content of the New Math curricula. As a result public criticisms increased. (Klein, 2003)

The Back to Basics period (1972-1985), was a strong response against the new math and a call for a return to the traditional mathematics curriculum, but it was soon to be replaced by the Standards Movement (1985 – present). This was predominantly the result of the work on standards by the National Council of Teachers of Mathematics (NCTM), *An Agenda for Action*, 1983, and *Curriculum and Evaluation Standards for School Mathematics*, 1989. (Valley, 2011).

The way that new mathematics curricula are introduced to schools, teachers, and students, makes it hard for teachers to use initiative, imagination, and creativity. For example, when I first arrived in the summer of 2003, the new Math A and Math B curricula were about to be introduced. These were classic mile wide and inch deep curricula[10] that guaranteed students

would learn a bunch of procedures but make very few connections. The math would be isolated and mechanical. The new curricula came complete with new lesson plan design (the workshop model), and a horrific daily pacing plan that could have been designed by John F. Bobbit (1913), who, you might remember from earlier, said that teachers must be required to follow the methods determined by their administrators because they are not capable of determining such methods themselves (Ireh, 2016, p7)

Since 2003, this process has occurred twice more, and now in 2019, we are about to move to the Next Generation Standards (although this is more of a fine tuning of the Common Core Standards, than a completely new curriculum). While many of these curricula and related paraphernalia had valuable elements, they were each presented as if they were the answer to the math malaise that for so long has dogged mathematics instruction in the U.S.A.

Trying to Make it Work for Everyone

The New York City Department of Education is a huge system with over 1.1 million students. The student population is mainly comprised of Asian, African American, Hispanic, and white students. Over 40% of the students speak languages other than English at home. This is a complex mix of 162 different languages. It is a logistical nightmare for the department, and for the teachers in city schools. It is also a serious problem for the parents and caregivers, as well as the students themselves. The big problem with having so many students who don't have English as a first language, is finding teachers that have the relevant language capabilities. It is very common to visit a class and find a number of students not able to follow the lesson because they can't speak or write English, and the teacher can't speak or write in the language of the students. The one exception is Spanish. Schools generally have sufficient teachers who speak Spanish.

Students in city schools are rated using the system of performance levels from 1 through 4 (where 4 is the highest level). It is now fairly common for some schools to be made up almost entirely of students at levels I and 2. The consequence of this is that virtually every student needs considerable help to have any chance of success. In some schools this could mean that a majority of the students are 4 or 5 years below grade level. Many of the level 3 and 4 students attend selective schools, private schools, or charter schools, leaving the neediest students in the city school system. The implications for teachers and students are enormous. There is pressure on principals and teachers in public schools because all students in a given grade level are expected to do the same final examination. Some important information based on a recent discussion with a senior principal, is that schools, principals, and teachers, have always been assessed on student proficiency, but the NYCDOE has now introduced a component that measures growth and this will be included in the school's evaluation[11]. Let's look at some examples of students in a city school.

Aliyah is struggling with her math. She is unable to do single digit operations and has trouble reading the question in many cases. She requires regular one on one support and is generally unable to operate independently. Like many students, student A is highly dependent on her teacher and is struggling to keep up with the very demanding pacing plan. Teachers often have to make decisions that prioritize some parts of the curriculum over others, and whether students should use calculators even for very basic calculations.

Brianna is one of many students with interrupted formal education and her parents do not speak English. She will probably count, add and subtract on her fingers and be unable to keep up with the regular class work. She often can't understand what the teacher is saying and lacks confidence. Her parents have not been into school and do not know how to help their daughter.

Brianna's teacher spends as much time with her as she can, and often stays back after school to work with her.

Caleb is mildly autistic and is so far unable to do even the most basic arithmetic. Caleb's teacher has spoken to his other teachers and knows that he is very good at art, sports, and US History. He has an individualized Education Program, and is entitled to several accommodations including extra time for tests and a reader for some questions.

Jayden is interested in school and works hard but is struggling with the basics. He uses a calculator but does not know if his answers make sense. He is the oldest child in his single parent family and is often late or absent because he looks after his younger siblings.

Many of the students have Individualized Education Programs (hereafter referred to as IEPs). Whilst this often means that they get additional support and accommodations, many still require a great deal of time to learn new skills and understand concepts.

Let me give you an example. Elisabeth has Asperger's Syndrome. During her early school life she was bullied, and treated as a person who was disabled and different. She changed her school to a public school. Here she was treated like a real person with potential. She became an athlete, a cheerleader, and won a number of academic awards.

Elisabeth has just graduated from college with a Bachelor of Science in therapeutic recreation where she made the Dean's list. Once she was treated as an individual with skills and potential, she thrived! She got through her studies with grit and determination, as well as a mountain sized dose of help from her family.

Is Elisabeth different? Yes she is. Elisabeth has a unique and quirky sense of humor, but is acutely aware that she is perceived by others as different. As a young lady about to enter the work force, the earlier, deficit-based approach to her disability will always haunt her. Despite her

successes, she has many issues and struggles. Often things that others take for granted are a problem.

One day, Elisabeth came to me and asked if I could show her how to balance a check book. Elisabeth has always been weak at anything mathematical, but she is a super smart girl who is very aware of the never-ending putdowns, sometimes subtle, sometimes not. I asked her to take a seat, and we talked about how a bank account works. She said that often when people explain things, they use unnecessarily complex language. She feels like they are just talking at her instead of knowing her well enough to understand her learning style. We talked about balancing a bank account and she quickly saw that it is just about adding deposits and subtracting withdrawals. She walked away happy.

The NYC Department of Education's website describes the IEP as a written statement of the Department of Education's plan to provide children with special education services in the least restrictive environment. This means that children will be educated with their non-disabled peers for as much of the day as possible. The IEP team, which includes the parent(s), will determine if a child is eligible for special education services and thereby require an IEP. School age students are eligible if their needs meet the criteria for one or more of the 13 disability classifications[12] listed in the Individuals with Disabilities Education Act (IDEA); and the disability affects education performance and/or ability to learn and benefit from the general education curriculum.

Eligibility cannot be based on a lack of appropriate instruction in reading or math or limited English proficiency. If a child is not eligible, an IEP will not be developed. Instead, information from the evaluation will be given to the school principal, so he or she can work with staff to help the child. Disability classifications include autism, deafness, blindness, emotional disturbance, learning disabilities, speech or language impairment, and traumatic brain injury.

Many of the curricula, while they include elements of differentiation, are designed for level 3 and 4 students. Essentially, this means that a student at level 3 has met the required level for that grade and level 4 means that a student has exceeded the requirements for that grade level. Curricula are written with the assumption that students come with an appropriate prior level of knowledge in mathematics, when this is so often, not the case.

WHAT'S THE POINT?

So what is the upside? It might seem that there are so many challenges that helping kids to graduate is a lost cause. We know from experience and research that students do better in student centered problems-based classrooms such as advocated by the National Council of Teachers of Mathematics and by Realistic Mathematics Education (RME), developed at the Freudenthal Institute of Utrecht University in Holland (Gravemeijer, 1994). RME advocates the importance of regular productive struggle, in a student centered, culturally sensitive classroom that encourages student to student dialogue and values student thinking. It is a classroom where scaffolding within Vygotsky's Zone of Proximal Development allows students to reach their potential by working with teachers and more capable others to help bridge the gaps and provide an environment that optimizes the students' potential.

It sounds, then, like the struggle is too much, and the benefits minimal. Not so. Every child is unique and special. The work that special education teachers do has a huge impact of every single student as it helps them to feel like they matter.

Celebrating diversity

We talk about diversity quite a bit, but what does it mean? What is the nature of diversity in city schools? Dorinda Carpenter (2004) from the Harvard Educational Review, said that our schools reflect the sociocultural and sociopolitical context in which we live, and that this is unfair to

many young people and their families. She further states that one of our primary roles as educators is to interrupt the cycle of inequality and oppression. In the review of Sonia Neito's book, *Affirming Diversity, the Sociopolitical Context of Multicultural Education,* Carpenter, (2004), highlights the importance of multicultural education and how it can have a substantive and positive impact on our students.

There is much to consider in cultural diversity including language, religion, country of origin, interests, socio economic group, prior knowledge, childhood experiences, immigration status, and disabilities. Many of the things already discussed are often seen from a deficit perspective, but many of these things can be assets. Imagine the richness of a classroom that encompasses the multiple cultures, languages, and experiences of this highly diverse student body. Imagine a classroom where students with disabilities were not treated as incapable of anything. Imagine designing lessons that are culturally sensitive and inclusive. Imagine lessons that incorporated a few minutes of mental math each day to address the needs of students whose skills were poor in this area. Imagine including a problem-solving strategy framework such as that advocated by George Polya (1971) so that students could make progress with every problem they attempt. Imagine a classroom where teachers know the students well enough to understand, not just what they are teaching, but what each student brings to the class.

Out of the Frying Pan…

Let's now consider our teachers for a minute. Teachers come to school either directly from teachers' college, or from one of many programs that retrain people from other professions. They come into the classrooms, into a very challenging work environment, often receiving very little support and many diverse and often contradictory instructions. Teachers are assessed based on knowledge, experience, and individual initiatives that they bring to the classroom.

Making Sense of What's Going On

This research is conducted within a sociocultural framework. Such a framework focuses on the political, social, cultural, and historically mediated aspects of life (Alexakos, 2015, p.14). This framework is ideal for authentic inquiry which is designed to embrace and understand the richness of difference. My research design[13] where applicable, allows for the use of methods such as prosody, dialogue, cogenerative dialogue, polyphonia, and polysemia, and a value system that welcomes the ideas and beliefs of all participants. I also use tools such as reflexivity to revisit and understand phenomena and embrace the dialectic that arises between different learning theories, and different beliefs.

This study uses a critical research methodology as defined by Rowhea Elmesky and Kenneth Tobin (2005) to seek out systemic relationships of power, especially as they are being used to discriminate, disenfranchise, or control others. The goal of such research is to ultimately transform classrooms by revealing the dominant social ideology, so that individuals can see what is happening and make more informed choices. One of our foci will be on the teacher evaluation model currently in use. We will use cogens between the PI and teachers to discuss what actually happens as well as some possible alternatives. Teachers taking part in this study will be selected serially and contingently – not because they conform to some preset ideal. An example will be that I select the first teacher because he/she are interesting and available, but I select the second teacher because he/she is different in many ways to the first. Neither teacher may necessarily conform to what I consider to be an excellent teacher. This is all the more reason to understand their epistemologies through observation, and dialogue.

My research is emergent and as such includes purposeful selection of participants. I regard subjectivity as an asset. I employ event oriented[14] social inquiry, described by Kenneth Tobin and Stephen Ritchie (2011). The essence of event oriented social research is identifying events, which are regarded as breaches to the enactment of culture – breaches that rupture social equilibria. Event oriented inquiry stands in contrast to methods grounded in random sampling, statistical analyses, and generalizing from samples to populations. In contrast, I adopt purposeful selection of participants in this research, aligning with Ken Tobin (2018, p.1) who notes that…

> Emergent design is not based on the investigators' constructions but develops as the research unfolds. Emergent designs are not predictable and are often divergent and open ended. Such design does not necessarily answer any specific a priori questions, but instead leaves us wondering what's next. That is, questions, if they arise at all, are emergent and contingent on many aspects of context.

A FRAMEWORK OF AUTHENTICITY

The nature of the inquiry I employ is authentic. My multilogical approach is based on the authenticity criteria of Egon Guba and Yvonna Lincoln, and the Belmont Report. This study rejects the premises of the positivist paradigm in which experience is regarded as objective, testable, and independent of theoretical explanation (Guba & Lincoln, 1985). The Belmont Report outlines basic ethical principles required for research involving human participants. These include respect for people including the acknowledgement of autonomy and the requirement to protect those with diminished autonomy. Another principle is beneficence. This is where people are treated in an ethical manner not only by respecting their decisions and protecting them from harm, but also by making efforts to secure their well-being. Finally, there is justice where each person has an equal share, taking into account individual need, individual effort, societal contribution, and merit.

Guba and Lincoln's Authenticity Criteria (1989), are the backbone of this research. The chief tenets are briefly outlined as follows and are about faithfully representing and honoring stakeholders. Authenticity Criteria concern achieving fairness through a hermeneutic dialectic process. This is achieved by seeking out all stakeholders and identifying their constructions and opening negotiations with stakeholders of recommendations and of the agenda for subsequent action.

There are four authenticity criteria for research. It is important to note that two of these, catalytic and tactical authenticity are about change (Tobin, 2018. p.1). The criteria are:

Ontological Authenticity

This is the extent to which individual respondents' own emic constructions are improved, matured, expanded and elaborated. It is an improvement in the individual's conscious experiencing of the world.

Educative Authenticity

This is the extent to which an individual respondent's understanding of and appreciation for the constructions of non-participants are enhanced.

Catalytic Authenticity

This is the extent to which action is stimulated and facilitated by the evaluation process. It creates opportunities for all members of a community to benefit from being involved in the research, especially those who could not easily help themselves. Catalytic authenticity is about positive social change where the research is the catalyst for such change.

Tactical Authenticity

Tactical authenticity is how stakeholders and participants are empowered to act by providing the opportunity for inputs, and having a hand in shaping the focus and strategies and the equitable

share of products. It is about accepting and making change. Guba and Lincoln (1985, p. 41) further state that …

> designs must be emergent rather than preordinate: because meaning is determined by context to such a great extent; because existence of multiple realities constrains the development of a design based on only one (the investigator's) construction; because what will be learned at the site is always dependent on the interaction between investigator and context, and the interaction is also not fully predictable; and because the nature of mutual shapings cannot be known until they are witnessed. All of these factors underscore the determinacy under which naturalistic inquiry functions; the design must therefore be played by ear; it must unfold, cascade, roll and emerge.

METHODOLOGIES, DESIGN, METHODS, AND THEORIES.[15]

The methodologies I adopt include ethnomethodology, event-oriented inquiry, critical inquiry, and authentic inquiry. The goal is to document the methods and practices through which society's members make sense of their world. What more is there? Ethnomethodology's etymology can be broken down into its three constituent parts: ethno methodology, for the purpose of explanation ethno refers to a particular sociocultural group, method refers to the methods and practices this particular group employs in its everyday activities, and ology refers to the systematic description of these methods and practices.

The design is emergent, as opposed to predetermined. Meaning is determined by context rather than the investigator's construction due to the complex interaction between investigator and the investigated. The nature of such research is that the outcome is unknown beforehand and therefore cannot be known until the events take place. The story will become known as it emerges.

The nature of emergent design also has an impact on theories. Most theories will be addressed as they unfold however there are some theories whose use is already evident. One of these is Polyvagal Theory, first proposed by Stephen Porges (2003). This theory notes that the brain has an evolutionary bias to protect us from harm.

Alexander Lucas et al (2018, p.8) describes Polyvagal Theory the following way.

> Polyvagal theory provides an understanding of the cues for safety that are embedded in positive social engagement behaviors, including prosodic voice, endearing facial expressions, and welcoming gestures that are capable of turning off vigilance and enabling an individual to feel safe, and that the evolutionary bias of the brain, can be countered by the intentional experience of positive emotion, moving one towards brain states that promote openness, curiosity, and creativity.

Stephen Porges (2003) says that the social engagement system is a key feature of managing threat. Finally, one key method could be conversation analysis based on the work of Paul Ten Have (1999) and more broadly on Harold Garfinkel's 1967 book *Studies in Ethnomethodology*. His work was based on the idea of common-sense reasoning and practical theorizing in everyday activities (Have, 2004). Have's model starts initially with straight audio recordings but builds with the addition of visual details such as the direction of the gaze on the participant, as well as gestures by the participant.

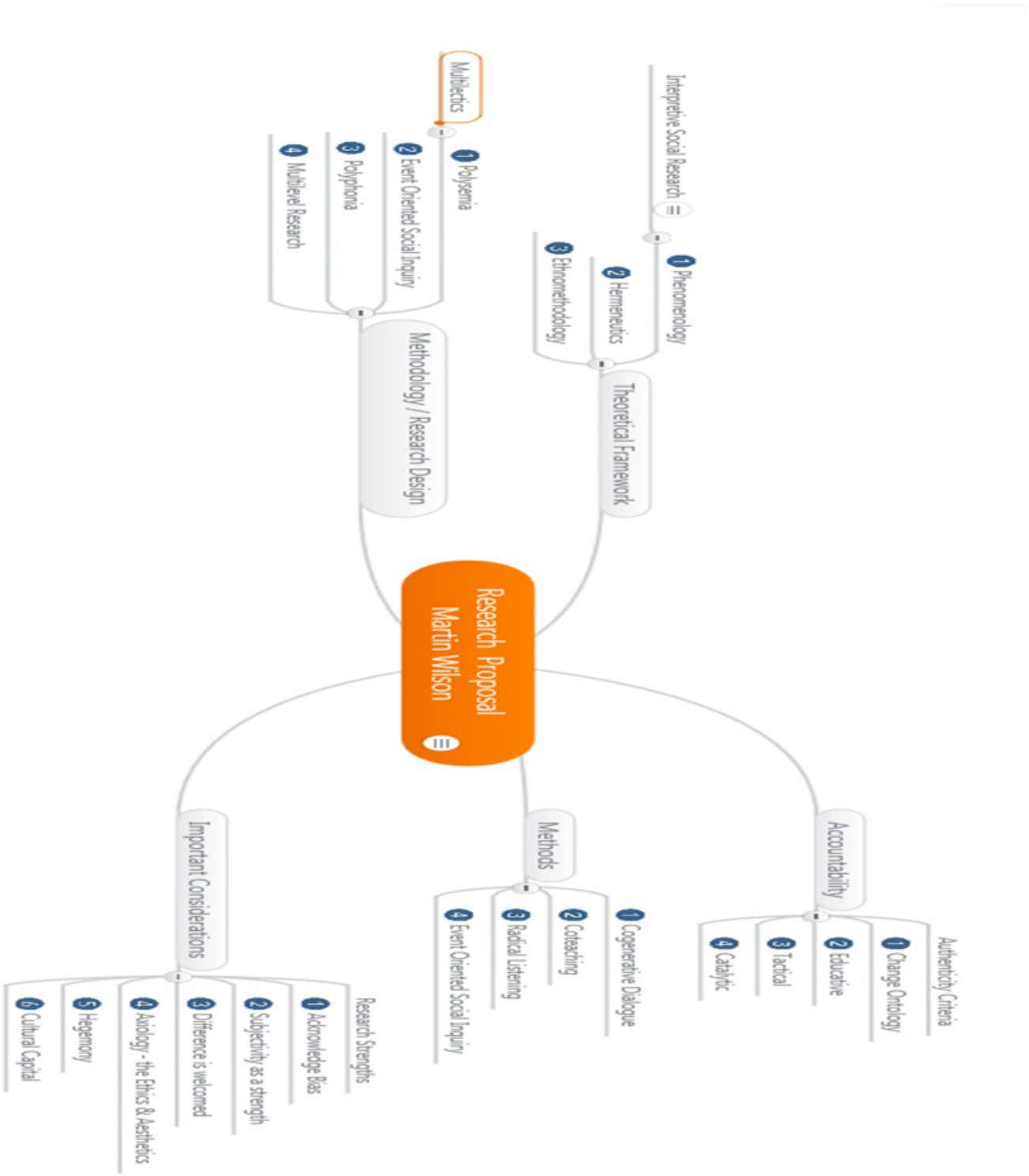

Figure 2 Research Map

Big Brother is Watching.

Joe Kincheloe and Kenneth Tobin (2009) in *The much exaggerated death of positivism*, describe the almost insidious infiltration of positivism into our lives and institutions[16]. Positivism is an impediment to freedom and choice. It affects free speech and supports the idea of convincing people of a particular argument and lends itself to hegemony. It is mono everything, limiting research to a single method, and conformist, reductionist data. Crypto positivism limits voices to monophonic, and meanings to monosemic, rather than the rich chorus of polyphonia, and the rich context of polysemia.

Despite major rethinking in the social sciences, many researchers are still impacted by crypto positivism when asking questions such as: Is this research? How can you generalize from that? Why is your sample so small? How can your research be so subjective? Why are you bothering with the outliers when you can see that they clearly do not conform? In my approach to research I am vigilantly conscious to remain alert to possible crypto referents that penetrate the methodological bricolage that drives what is done. Accordingly, an important component of the ongoing work includes critique of what I am learning and doing by a community of peers. This includes the work done during research squad meetings as mentioned earlier. The research squad is comprised of between 3 and 7 people who provide mutual support and a forum for open dialogue. It is an invaluable resource and always benefits participants. Most members of the squad are in the latter stages of their studies. Most work full time and some have young children. Despite their busyness, people make the effort to come along and to contribute to the dialogue. The research squad is also a very motivating activity, and motivation is a critical element in the challenging task of writing a dissertation.

Radical Listening It's Really Just Good Manners

The perfect running mate for cogen, radical listening is about extending this most poorly used skill. Radical listening gets the listener to put themselves in the speaker's shoes, and really value what is being said. It means thoughtfully making meaning of their words and considering their standpoint. I can recall many times when I have been in a conversation with someone, and suddenly realizing that I haven't the faintest idea what was said. Radical listening is a critical component of communication which is discussed further in the next section. Being attentive to a speaker in a conversation is communicating respect for their ideas. You consider them important enough to give your full attention.

Tobin (2009) explained that Kincheloe regarded radical listening as …

> a way to understand others in terms of their standpoints and axiological commitments. Joe always tried to understand the value of what others have said, its associated standpoints and its potential. He was rare in hearing the kernel of an idea, and encouraging the speaker to grow that idea in his or her own way. (p. 505)

Mikhail Bakhtin (1993) has his own version of radical listening. He believed that authentic human life is an open-ended dialogue, and that it is not enough to simply understand the other's perspective. Bakhtin said that an idea can be made other by being seen from the outside (Robinson, 2011). This means that a new understanding can often be achieved by putting yourself in the speaker's place and trying to see the idea through their eyes rather than just seeing it from the outside.

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Sending the Right Message

A few weeks back, I was talking with a colleague about the summer vacation. We discussed how nice the New England area was, and although we hadn't seen all of it, we really enjoyed what we had seen in Vermont, New Hampshire, and Maine. I talked about the possibility of retiring up there, and how nice the people seemed to be. At that point my colleague, who was African American, asked me if there were other people like her up there. It took about half a second for me to realize the enormity of what she had asked. Even though in my work in New York City schools I have sometimes felt different, I have never felt anxious about my skin color, or ethnicity. I have never considered such issues before I had travelled somewhere, and I realized that in this country of immigrants and multiculturalism, there are people for whom acceptance as an equal is an almost everyday issue.

In a big city like New York City, where we are regularly mixing with people of different cultures, skin color, and racial groups, such concerns are probably less common. But it seems that the 'feeling unwelcome' idea is more of a concern in smaller communities. Whether this is a real concern, or just a perception, doesn't make it any easier.

Why am I using this as an example of communication? I think that this is the communication of rejection. When you stare at a stranger in our community because they are wearing different clothes or have a different skin color to the 'regular' folk you are communicating very clearly. All of the non-welcoming signs that facial expressions, and posture can transmit will highlight the issues raised by polyvagal theory. For example, just as cues for safety are embedded in welcoming gestures, prosodic voice, and welcoming facial expressions, lack of such cues can easily trigger a transition into fight – flight mode. A central tenet of polyvagal theory is that the most basic human need or motive is safety (Lucas et al, 2018, p.9). The social engagement

system is a key feature of managing threat. When we make people feel welcome by an acknowledgement such as a smile, or a hand signal, or even just saying hi, then their defenses come down. They are no longer threatened but are instead in a warm and welcoming environment.

Mitch Bleier, in a recent conversation, pointed out that people often have the daily experience of being "othered" by the dominant group. He also suggested that the dominant group often doesn't recognize that this is even an issue. What is it like to know every day that a particular group has central legitimacy, and that your group does not?

I believe that one of the most important human needs is that of being accepted into a community, and welcomed as a valued member of that community. I remember a year or two back. We had just moved into a new neighborhood, and my family and I were aware of a coldness. One of our immediate neighbors completely ignored us when I said hello, and would never acknowledge any sort of wave or greeting. Almost two years later and he has progressed to acknowledging my wave, but that is about it. It turns out, that this little community is one where most residents have been there for generations, and newcomers are treated with caution and suspicion. We are getting used to it now, and have since met a number of very nice and welcoming families a bit further up the street.

A few times during this dissertation, I talk about my own sense of difference when I first came to America. The awareness that I felt wasn't a bad thing, it was just a sense that I was different. During our squad meetings at the Graduate Center, we often share our early drafts so we can have a chance to get some peer feedback on the direction of the writing. One of the squad members, Mitch, suggested that the difference that I had initially felt, was probably nothing

compared with the differences that people from radically different cultures, with different skin color, and different languages to the dominant culture, must feel.

He was right of course. When I think back to the opening paragraph of this section, I realize that for many people, the knowledge that they will not be automatically made to feel welcome is ongoing. It could be because they don't conform to some group's idea of who is acceptable, and who is not, based on prejudicial criteria. It is part of their lives, and is with them as they venture out of their 'comfort zone' during simple everyday things such as going to school, work, the store, or just going for a walk down the street.

Communication is a critical part of learning and life. We can communicate using prosody, proxemics, volume, and listening. My own ontology has been shaped by a lifetime of interactions. Each interaction has some impact and results in some change. My life's experience involves thousands of interactions. Sometimes the ideas of another make a big difference, sometimes not much at all, but every interaction has an impact – even a smile from a passing stranger, a rude gesture from another driver, or the offer of a seat on the subway from someone I have never met before. It could be the person who pushes past you at the checkout, or conversely lets you go ahead because you only have one item.

The subway is (to me anyway) a rich source of different examples of communication. A few weeks back, I was on the subway traveling from Grand Central to Court Street in Brooklyn. The train which was already filled to capacity, pulled in to the next station, and even more people squeezed in to an impossibly tight space. The doors struggled to close and commuters tried to respect what little personal space was available. Sometimes rich conversations broke out. A family from Florida (Mom, Dad, and four young children), were traveling in New York City for the first time. It was clear that they weren't sure where to go, and a number of people offered

help with directions on which train to get, which station to get off, and other things. People who weren't talking were listening in with interest.

The next station was better, we lost a few people and a few more got on. After the doors closed, a young boy who was sitting quietly, noticed a woman carrying bags was standing nearby. He motioned to her and offered his seat which she gratefully accepted with a smile and a thank you. This small display of courtesy probably set the standard of good feeling for the day. I'm sure that the boy felt good about his actions, and without doubt, the woman was very happy that she was treated with respect, and also happy to take a load off!

I don't think that we are always aware how our own communications impact others. Life is so packed with things that have to be done, that we don't always stop to think about those around us. Just a few days ago, I was coming into work on the subway in New York City, and a homeless (I assume) man made eye contact. He was a bright and cheerful character but he had clearly been through tough times. I stopped to talk to him for a minute. He was asking for money. The city has plenty of homeless people, and sometimes I give them a few dollars. I had a look in my wallet and all I had was a $10 bill. I told him that that was all I had but he put forward a very persuasive argument about why I should give him the 10 dollars. I realized that I didn't even know to the nearest hundred dollars, how much I had in my bank account and I weakened my stance. I asked him if he had $5 and if so I would swap him for the $10 bill.

He was so grateful that I was almost embarrassed. He was polite and articulate, and I wondered how he ended up begging on the subway. This guy, who had every reason to be miserable, used great communication. He smiled, he talked, and he put ME at ease. I was fortunate enough to have the power to make a small difference to him, and yet, strangely, what he gave me was far greater than anything that I had given him. Experiences like this shake up our

own axiology, and bring home the staggering inequalities that people face. I was lucky enough to have benefited from being born into a white middle class family. I have never gone hungry, and I have always had a warm bed to sleep in.

The idea of individual difference is an important part of communication. Our common interface is language, and yet, individual words and phrases have different meanings to different people depending on your own ontology, culture, and axiology. I am Australian, and Australia being a physically isolated country, we can easily be oblivious to other cultures. When I came to America in 2003, I remember being very aware of my differences and somewhat self-conscious. In time, I began to realize that almost everyone around me was also from somewhere else.

I remember an incident at Foxwoods Casino in Connecticut during my first year here. I was having a moderately successful game of blackjack and the drink waiter stopped to see if I wanted anything to drink. I said that I would have a white coffee; she went quiet for a minute and then started to laugh! She even called her friend (another waiter) over, and told her that I wanted a white coffee. Of course this is a trivial example of a communication problem, (and white coffee in Australian parlance, is just coffee with milk). Even after more than 15 years in America, I still get my breakfast order wrong at the local diner. I have often thought how hard it must be for someone from a totally different culture, who speaks a totally different language, to come to grips with the nuances, and subtleties of American culture(s). As an English speaker, you can travel pretty much anywhere, and you can get by. Sometimes when I work in classrooms, I see students from Eastern European countries who speak no English, and who might be the only one in the class who speaks that language. They come to school day after day, and sit in a room doing a lesson that is meaningless to them.

This issue is even more acute for people for whom communication is more critical than getting the server to understand their coffee order. Imagine what it must be like for the immigrant children being removed from their parents. In many cases the total lack of communication combined with families being ripped apart, and parents being deported without their babies and children. This was not just a matter of communication, but a combination of barriers including red tape, ignorance, and lack of any sort of consideration for the human rights of people who were in the most vulnerable state imaginable. The fact that hundreds if not thousands of these young children have still not been reunited, is unforgivable.

How does communication mediate the work of teachers in urban schools? Teachers have a very challenging job. They have to walk a fine line between administrative requirements, and the needs of the students. They have to be respectful, and yet sometimes firm. They have to know their kids well enough to show that they care. I recall one little boy in a grade six summer class. He had a reputation for being difficult, but in the smaller summer institute class, I had a chance to get to know him. We talked a little each day and I found him very responsive and smart. After school restarted and he was back with his regular teacher, I noticed that he appeared to be very withdrawn. As soon as I could, I quietly asked him what was wrong. He said that he hated the math teacher because he is mean. It turned out that the teacher wouldn't let the boy go to the bathroom. He felt that he was being treated unfairly and so had withdrawn from the class. Whilst I understood the issues that the teacher was facing, I also understood where the boy was coming from. This case highlights the challenging role that teachers play.

We need rules, otherwise there would be anarchy. It is the application of those rules that is challenging. Something as simple as going to the bathroom can be a major issue if it is not managed well. My own feelings are that if the classroom has an atmosphere of mutual respect,

then students are more likely to act responsibly. How do you balance humor, toughness, and niceness so that a state of reasonableness is prevalent?

Poor communication can also result in misunderstandings. One large city high school that I worked at had more than 30 mathematics teachers. One teacher, Fred, was very senior and highly respected. I wasn't assigned to work with him but I always said hello when he walked past. This continued for about 3 or 4 years, and he never once acknowledged me. He would come into the teacher room and act like I wasn't there. Eventually I gave up and didn't even try to be friendly. I wanted to pretend that I didn't care, but rejection is a very powerful thing.

One day I was sitting in the math room, and Fred was there talking to another teacher. I noticed that during the conversation Fred was having trouble understanding what was being said. He explained to the other teacher that he was almost deaf, and that he could hear better out of his other ear. Now it all made sense! Next time he came to the math room (I was only there about once every two weeks), I sat down next to him, on his good side, and talked to him. He turned out to be a very decent person. In the weeks ahead, we ended up having a number of good conversations, sharing ideas and resources. I often wondered how he could teach with his hearing deficit, but it seems that he had developed a style that worked for him.

I think that this story illustrates the need for all of us to be more aware that people have different ways of being, and in this case how I was judgmental and even dismissive of a good person. This idea of course has implications for the way that we interact with students and highlights the importance of not rushing to judgment.

Sometimes our own axiologies and ontologies can be transformed in ways that are either helpful, or harmful. By understanding that the society that we live in is polysemic and rich, and multifaceted, and that our interpretations are heavily influenced by our own experiences, then we

can hopefully better understand what is being communicated and avoid unnecessary misunderstandings. This idea is espoused by Guba and Lincoln (1989) in two of their authenticity criteria educative authenticity and ontological authenticity.

A Place in the Classroom

In an effort to move away from the transmissionist 'tabula rasa' model of teaching and learning, perhaps some serious thought about another model of learning might be useful. Communication is not just about the teacher giving the student information. It is about an interaction between two people. The valuing of what the student brings to the conversation. What does the student already know, what is their ontology? What is their preferred method of communication? Learning in the classroom should be far more eclectic, rather than the very narrow disconnected model that seems to be used in many classrooms. I recently read an article by Mitch Bleier (unpublished), called Claudia and the Mango. Mitch is a colleague from the Graduate Center. This is a single page unpublished story about a little girl whose own life experiences surprise the older more experienced adult. The second last paragraph sums it up…

> I marveled at the deft, confident, matter of fact way that this child approached a task that I had not considered her up to. I remarked, with tangible admiration, "Claudia, I've never seen anyone eat a mango so neatly." She looked over (the ability to understand me restored) and a broad smile fought its way through tightened muscles—Claudia could not control a welling pride and satisfaction engendered by genuine wonder and respect for a part of her life that often generated an uneasiness – fear of her family and home life being exposed as odd, different, less than.

This little story brings to our attention the importance of culturally relevant pedagogy. Our students are not empty vessels, but are instead, living, experienced human beings who are sensitive and aware of what goes on around them. It really highlights what Greek Philosopher

Plutarch said almost 2000 years ago. “The mind was not a vessel to be filled, but a fire to be kindled”.

Students bring richness and diversity to the classroom and for this, we should be very, very, grateful.

COGENERATIVE DIALOGUE – A WAY FORWARD

The importance of cogens as a method cannot be overstated. Not only is it a very important component of my research, but continues to be important in the research of former Graduate Center students such as Gillian Bayne, Chris Emden, Gillian Bayne, and many others. Gillian Bayne and Kathryn Scantlebury (2013), describe cogenerative dialogues as a way for participants to examine the local content for improving teaching and learning through a dialectic structure of pedagogy | research.

Chris Emden and Ed Lehner (2006) link cogens to the work of Guba and Lincoln and the Belmont report when they acknowledge the transformative nature of cogens. They say how cogens acknowledge the differences between multiple participants, multiple fields, and varying ways of knowing. Kenneth Tobin (2005) says that cogens provide participants the opportunity to reflect on shared experiences and open arenas where participants can take collective responsibility for the results in the classroom.

Cogen is used as a way for two or more participants to understand each other’s standpoints and consequently their epistemologies, ontologies, and values. It is where shared experiences are used to construct local theory with the intention of improving learning of students. In cogen, learning communities develop a praxeology rather than just observation-based theories. (Praxis is the process by which a theory, lesson, or skill is enacted, practiced, embodied, or realized).

At the Starting Gate…

The selection of participants for this research involved a number of important considerations. Even though I am working with teachers in classrooms almost every day, I still had to get through a few hurdles. My first few potential candidates were not prepared to give me the time nor were they prepared to be recorded. While I regularly have cogens with teachers during school hours as part of my work, the cogens that I audio recorded happened outside school hours and off campus. Prior to the start of the research, I was acutely aware that the selection of participants for the interviews had to be done serially and contingently[17]. I began to think about all of the teachers that I have worked with and to mentally pair off the most different and interesting teachers I could find. Teachers were allocated pseudonyms to preserve anonymity.

With these considerations in mind, we begin the first phase of our study by selecting a teacher and having a dialogue. Selecting the second teacher involved a number of false starts, but the selection was almost made for me as George's story began to unfold before my eyes. I had actually begun recording cogens with another teacher fairly soon after I had selected the first teacher, when George came charging into the spotlight. He was perfect. Different in almost every way from my first selected teacher, he was also not that cooperative initially, but did eventually come on board. He gave me the opportunity to further build on the understanding of teaching mathematics in public schools in New York City. Radical listening is a critical part of this dialogue. Given that this work is emergent and contingent, we cannot be sure of the direction the dialogues will take us ahead of time.

CHAPTERS IN THIS DISSERTATION

Before proceeding with chapter 2, I take this opportunity to sketch out what is forthcoming in this dissertation.

Chapter 1 is an overview of the research as I currently see it, including a summary of methods and methodologies. It hints at some of the challenges and highlights to follow and presents my own story as a way of better understanding my axiology and ontologies.

Chapter 2 includes a number of vignettes which help to set the scene for the research to follow. They are a snapshot of the enormous scope and challenges facing city schools. They help us see the challenges at every level – student, teacher, and principal.

Chapter 3 is Marissa's story. It looks at mathematics teaching through the eyes of a young and enthusiastic middle school teacher. We examine the struggles and successes of someone who feels excited yet undervalued.

Chapter 4 is George's story. George is a hardworking and dedicated veteran teacher who has seen a lot. He is white and middle aged. He has Greek ancestry of which he is very proud. He is single and lives alone. He is pessimistic about the future of public education in the city. He was formerly a bright and enthusiastic person but these days is mostly a sad figure who rarely smiles and is counting the days until retirement.

Chapter 5 A Day in the Life looks at a teacher, a student and a principal. During this chapter we look at three vignettes of three important examples not necessarily of typical people, but of people who, with the use of thick descriptions, become important examples of human beings who are part of the urban education scene in New York City public schools.

Chapter 6 Pathways contains my review of a prevalent worldview – that every student should go to college. Is this what is really best for every student? The idea of multiple and very diverse pathways is examined through the eyes of a number of people who have made choices that are different to current expectations.

Chapter 7 Impact of the Research – What's Next? In this chapter I revisit and reconnect some of the major ideas from the first six chapters. Chapter 7 is an opportunity to consider the journey and adjust our thinking. Why do schools, teachers, and principals do what they do? Why do we still have a top down system of administration? Why do we steer all students towards college and what happens to those that don't fit the mold?

CHAPTER 2: GROWING UP IN AUSTRALIA AND THE TRANSITION TO NEW YORK CITY

In chapter 2 I present some vignettes of a range of people and scenarios that are part of contemporary urban education. They begin with my own story where I set the scene for my own beliefs, and spend a little time with teachers such as Donna, principals such as Rahid, and schools such as those on Riker's Island in New York City. What I seek to show is how people and institutions we might consider as being on the fringe, as being different and outside the range of what we may superficially view as 'normal', are all part of the public education system in New York City. The chapter concludes with a brief introduction to George and Marissa who tell their stories in chapters 3 and 4.

In this chapter I introduce some of the many voices that are part of urban education. While there is a great deal of control exercised over teachers, the importance of polyphonia cannot be overstated. Polyphonia brings out the richness of the school environment through multiple different voices. This research does not judge what they say or how they say it, it simply gives every voice equal importance. Equally important are the many meanings that we hear and try to make sense of, and the nuance that each different meaning and interpretation of that meaning brings to the dialogue. We look at a number of environments including Riker's Island, and shine the light on a number of teachers and administrators to get a snapshot of their ontologies and axiologies.

In this chapter I present some of my own life experiences from childhood through to the present. From growing up in a small rural town in a setting and at a time that did not particularly value education and certainly did not set students on a unilateral path to college or university. It

was a time in my life where I learned that if I wanted something I had to go out and work for it. The short stories are important because they help mediate sense making. Understanding historical aspects help to complete the picture. The stories I include provide a number of snapshots of teachers, and even a principal. I conclude the chapter with a brief introduction to two of the key players in the chapters that follow – George and Marissa.

In this chapter I open with an expansion of my story and how my understanding of the system has been mediated by my life's experiences. My story is important because it describes my own unconventional pathway through life (including education and employment). It describes my exposure to people who have chosen a variety of careers and the impact of their work as it intersects with my own life. As I saw the work of these people, and the amazing complexity and ingenuity that trades such as auto mechanic, electrician, or builder require, I was struck by the contrast between my own experiences and axiologies and those of the decision makers in the NYCDOE. When I saw the work of hundreds of teachers during my work as a consultant, I often saw success despite the embedded crypto positivist system that evaluated teachers through a very narrow lens, and failed to really appreciate the wealth of talent that we have among our teachers.

It would be impossible to do a broad-brush generalization about teaching in New York City schools. The school system is a huge and complex operation that is composed of a vast array of people from a wide range of countries and cultures. In Chapter 2 I do a number of important things including laying down a foundation by using a number of vignettes that present a set of insights and experiences through the eyes of a diverse range of people. Initially I examine my own experiences because it helps the reader understand my axiology, and ontology. Authentic inquiry involving participant research is not an objective standpoint, but embraces the

subjectivity of the researcher. By understanding my pathways and my lived experiences, and the experiences along the way, readers can better see why I have focused on particular issues. In later chapters I look more closely at important areas such as vocational education and teacher evaluation, and in some ways, the consequent teacher attrition rate.

The vignettes that follow in this chapter begin with my background in education, and are followed by some snapshots of my experiences in New York City public schools. They are written as a series of events that took place, but are in some cases an amalgam of my experiences over time. These stories are written, not only because they are very different from each other, but because they represent some interesting parts of a puzzle. At this early point in the research these stories represent the challenges that teachers face every day in their classrooms and schools. The stories help to build a picture of the challenges, diversity, strengths, and weaknesses of the system and the people in it. The stories also help to establish my place in the research.

MY THOUGHTS ON THE RESEARCH

Given that I am a participant researcher, it is important that an understanding of my own background be included. Authentic inquiry, as described by Konstantinos Alexakos (2015), is situated in the world of lived experiences, and includes the researched, the researcher, and the research itself. Participants are not subjects, as we often hear them called in some other types of research, but are full agentic partners (Bleier, 2018).

This research is not seeking to generalize from a randomly selected group, but to seek out difference and contradiction, and to embrace subjectivity. The researcher, the researched, and the research, are all part of a social context and the interpretations and understandings that come from the research and existing literature are all interconnected. The work of the researcher mediates the work of the participants, and the work of the participants mediates the researcher.

Despite the fact that there are only a small number of participants, each of the participants, including the researcher, is influenced, changed, and affected by everyone that they work with including students, other teachers, parents, administrators, and researchers. Such lived experiences are rich and complex, and affect decisions, perspectives, and attitudes.

Later I discuss important ideas such as multilogicality – where we see and maybe sense the research from a number of frames of reference thus giving us multiple understandings. I am working within a polysemic and polyphonic framework such that I have multiple meanings and multiple voices. This reveals and embraces contradiction and disagreement which lead to a three-dimensional understanding of the complexity of the social interactions explored. Very few understandings could be considered as final, however. Throughout history, beliefs such as the geocentric model of the solar system were considered as fact. Credited to Greek astronomer Claudius Ptolemy in the 2nd century AD, this model survived for centuries despite mounting evidence that the geocentric model was severely flawed. It was not until the 16th century that a mathematical model of a heliocentric system was presented by the Renaissance mathematician, astronomer, and Catholic cleric Nicolaus Copernicus, leading to the Copernican Revolution. Ptolemy's geocentric system dominated scientific thought for some 1,400 years but came to an end with Galileo Galilei's support of the heliocentric model resulting in his famous trial before the Inquisition in 1633.(Encyclopedia Britannica, 2018) Such examples suggest that so called truths are often transient and just reflect current world views or the hegemony of the time.

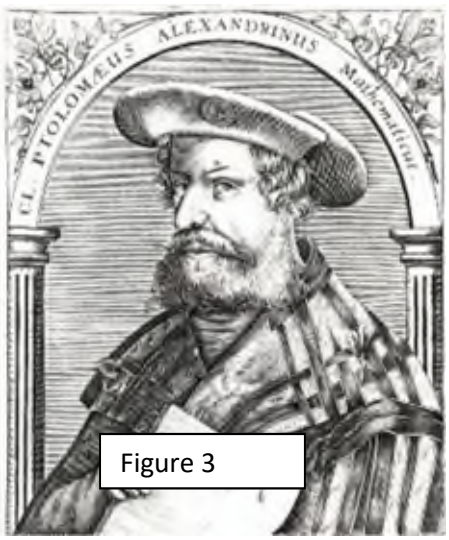

Figure 3

I also discuss important tools such as prosody, which has strong links to polyvagal theory. Prosody includes the patterns of stress and intonation in spoken language. When combined with facial expressions and physical cues, prosody can send important messages to those around us. In polyvagal theory, the autonomic nervous system has an embedded evolutionary bias to protect us from harm It is therefore highly likely that authentic inquiry will not produce a definitive answer or truth, but will just improve our understanding to the point where we are ready for the next steps or more questions.

The section that follows relates my exposure to, and involvement with, schooling and education. It also highlights the sometimes life changing decisions and experiences that this involved.

MY STORY: WHY DO I BELIEVE WHAT I DO NOW? A VERY DIFFERENT PATHWAY

My first school was in Sydney, Australia. The Haberfield Demonstration School was a wonderful place with inkwells and caring teachers. The local education department used this school as a model for training teachers. I remember once, as a very young student, I had done a project and was really proud of it. Somehow I spilled a blob of black ink from my pen and my heart sank as I saw my efforts disintegrate. The teacher saw my distress and invited me to take my project into the classroom next door, where he asked me to hold up my work as an example of how things should be done. This action lifted my spirits and got me past the despair that I initially felt.

From the City to the Country

When I was about 10 years old, my parents decided to move north to the state of Queensland, and we settled into a modest brick house in Southport, at the time, a small town of about 10,000 inhabitants. It was a young boy's dream. The house was on a gravel road that led to a river.

There was a paddock across the street with horses. I became an avid fisherman and learned how to dig for worms, and pump yabbies. I used to catch so many fish that I would give them away to numerous neighbors. This was a great way for a kid to make lots of friends and get to know people.

Most of the local kids had dinghies so they could go fishing. One day I asked my Dad if I could have a boat so I too could go out into the river for some serious fishing. My father was not a tradesman but he was very good with his hands. He had built a workshop out the back of the house and was always making something.

Buying a boat was out of the question, but my father knew how important this was to me, and one day he arrived home from work with a book of boat plans. Once we had selected the design, he began building the boat. He worked on the boat every night after work, and I sat in the workshop watching, asking questions, and helping where I could. I admired his ingenuity, his perseverance, and his sure handedness. He could bend a piece of wood, measure pieces so that they fitted perfectly and just know things that had to be done. It took a few months but eventually the boat was complete. A beautifully presented boat painted green and white. He even built a hand trolley so I could walk it down to the river. I think that, for me, this was where my appreciation for the trades began. My father was a man with very little formal education, but he had taught himself how to do so much.

He also taught me the basics. I learnt how to use a hammer, saw, and a drill. I learnt how to measure and tie knots. Many years later I used the skills that I learnt watching Dad in the workshop, and built a small house on my own land, doing everything except the electrical work.

My life as a boy growing up in a semi-rural atmosphere, in some ways shaped my later life. If I wanted something, I had to go out and work for it. My days were often spent alone in my

boat. I learned to depend on myself. Most of my socializing was with adults. If I needed to learn something, I would ask my father or one of the other adults who lived nearby. I never considered myself as being talented with my hands, but I learned to do enough to get by, and to build a healthy respect for those who were highly skilled in areas such as woodworking or mechanical work.

Getting to school involved about a four or five mile bicycle ride into the Southport State School. Although I enjoyed the social life that school offered, I was less interested in the academic side. My school results were OK but there was little thought of homework with so many other exciting options available. Sometimes in the lunch hour, a bunch of us would go down to the river, after which we were invariably late for class. On one occasion I received six of the best from the deputy principal's cane – right across the fingertips. It was painful, but I always kept it quiet. If my parents found out there would be more trouble![18]

The years flew by and high school was similarly just a social event. The idea of tertiary education was not something that many people aspired to in small town Australia in the seventies. No one in my family had even completed high school. My mother was sent off to work as soon as she was old enough, and my father joined the navy and shipped off to fight in WWII at the ripe old age of 17! My idea was that as soon as I was old enough to legally make my own decisions, I would leave school and get a job.

I eventually left school without graduating and worked in a number of unsatisfying jobs, I began to realize that maybe things had to change, but change was a while coming. Both of my older brothers had joined the Royal Australia Air Force and their work primarily involved aircraft maintenance. At the age of twenty-one I followed suite and joined the RAAF. We did a

great deal of travel to various locations around Australia and South East Asia. I became friends with a number of the aircrew, some of whom are still my friends today.

My base was in Richmond, about an hour west of the city of Sydney. I began to think of next steps and the local high school was offering night courses for adults to help them get their Higher School Certificate. By now I was about 25 years old and starting to mature a bit. I enrolled and did well, particularly in mathematics.

My appetite was whetted and I began to think about where to go next. Whilst still in the RAAF, I applied to the University of New England situated in rural New South Wales, Australia for a place as an external student in their Bachelor of Arts program. I remember attending a weekend seminar at the university. The excitement that I felt was beyond anything that I had previously experienced. University was just for smart people, and yet, here I was, enrolled in Pure Mathematics 101.

After the weekend I arrived back at the air base and just wanted to talk to people about my experience at the university. I was fired up and ready to go, but nobody was really that interested. Undeterred, I proceeded with the application and began to do the work. I was motivated, and enjoying the interactions with people who, like me, had realized that education was giving them a second chance. It took six years. After the first two years I transferred to the school of economics, and I graduated with an economics degree majoring in pure mathematics and economics, this all happening at about the same time as my work with the air force was coming to an end.

The big question about an economics degree is what do you do with it? But the fire had been lit and I began the next phase of my life. I spent the next few years working with my older brother in his boat shop, but the beginning of an idea was emerging. My math professor put me

in touch with a number of Armidale High School students. (Armidale is the town where the University of New England is located), and I began to consider the idea of teaching. The idea took hold and I applied to go back to the same university and complete my graduate diploma in mathematics education. This time I did the study as a full-time student. The year went quickly, and I found myself applying to schools in Queensland for a mathematics teaching position. I soon had a job at Windaroo Valley State High School teaching grades 8 to 12. This was a rural school with about a thousand students.

My scores in the graduate diploma were good enough for me to be invited back to do a master's degree in mathematics education. I accepted and completed this degree whilst I was teaching.

Teaching can be a tough game. Even though I was older than most beginning teachers, the reality of teaching is not something that you learn from a book. One person I got to know was Dave the janitor. He had been there from the school's inception and had always taken on a role far bigger and more comprehensive than that of a custodian/janitor. He was in his fifties, and took it upon himself to keep an eye out for teachers, especially new teachers who were struggling and needed some comfort, and sometimes some advice. He had a hut at the far end of the school and a well-stocked refrigerator that, after a tough day, served to relax stressed out teachers and put things back in perspective.

In those days, there was very little support outside your colleagues. You depended very much on your fellow teachers, and people like Dave, to vent, talk, and generally work things out. We also depended on each other for professional development, and often shared ideas. This was a community of practice that worked and that didn't depend on outsiders[19] to help out

I enjoyed working as a mathematics teacher, and continued at Windaroo for a number of years. When I looked back, I realized how much I still had to learn about teaching. Even now after more than twenty years in the profession, I feel that there is still so much to learn. I knew that my students appreciated my efforts, and I did try very hard to improve. My Sundays were almost always spent at school preparing for the coming week, preparing lessons writing exams, and planning. I also ran extra after school classes three days a week for my seniors. We always had a good attendance. I quickly found that the most important thing a teacher needed was a good relationship with the students. This is a point that was confirmed time and time again over the years. Teachers who built solid relationships with their students were more successful in a number of ways. These included better attendance, better performance by the students, and a better classroom atmosphere.

Windaroo Valley High School had a very comprehensive program which included a significant manual arts department. Students were given a great deal of choice and usually left the school well prepared for the next phase of their lives.

Early in 2003, I was chatting with a teacher who had just returned from the United States. He had been working as a mathematics education consultant in New York City. We talked about the work that he did and I started to think about applying. Why not? I sent in an application. A few months went by and I hadn't heard so I just focused on my work at Windaroo State High School.

When I look back on these years, I have nothing but good memories. I never once had my professional integrity questioned, and could always depend on my colleagues for support. The last time I was at Windaroo State High School was in June 2003. My life was about to change.

A WAKEUP CALL

"Are you ready to join the team in New York?"

Having applied for the job of mathematics education consultant in New York City a few months earlier, I had assumed that it probably wasn't going to happen. When the phone call came I suddenly had to make some decisions. The company was Australian and United States Services in Education, which conveniently compressed to the acronym AUSSIE.

After a mad scramble to take leave from my teaching job at a rural state high school in Queensland, get my visa organized, beg my best friend to take care of my old dog, and finalize the other things too numerous to mention, I was ready. I was excited, but nervous and unsure. A few months later I boarded my QANTAS flight and headed towards an unknown future.

First Impressions

The hallways were long and the noise invasive. It felt like I was surrounded by chaos. The grey painted walls, uninviting classrooms and tired looking teachers added to the feeling. I had left my life as a mathematics teacher in a rural high school in Australia and now was reassessing my new life with a sense of dread.

The mathematics assistant principal in this 4000 student high school was white, middle aged, and came with a sharp tongue and decades of experience. She also had a great sense of humor a quality that I suspect had carried her through the tough times.

The principal was younger and surprising in her candor. We talked for a while. She must have sensed my anxiety and the question on my lips. Her reply, "On Friday nights, I just drink until my week looks better."

Most parents work hard to provide an education for their children, and young adults. They try to ensure that everyone has access to the best possible education. Despite this there are many, many children who are being underserved at school.

One reason access to high quality education is skewed against lower income families is systemic. In many counties in New York, education is funded by property taxes. The education budget is therefore at the mercy of property values, and rich towns such as Chappaqua, or Scarsdale, have a substantial budget for their schools, whereas towns and villages in the same county such as Yonkers and Mt. Vernon, have significantly less income from property taxes, than Scarsdale or Chappaqua. This equates to a disproportionately high expenditure per child in the affluent suburbs when compared with students who live in a poorer area.

What is the Current State of Play in NYC schools?

From the very first day, my work was in huge, seemingly unmanageable, prison-like schools. I struggled to work with teachers in these stressful environments. Schools appeared to be autonomous in their decision making. There seemed to be an attitude of resignation.

Fifteen years later, the schools are mostly smaller – around three or four hundred students. Only a handful of the old mega schools remain. Many things have improved, but many things remain the same. The city has spent considerable amounts of money on professional development and yet, the enormous gap between what we now consider as best practice, based on a considerable body of research and actual practice, remains. Perhaps it is time to consider what sort of change we are looking for, and are we going about it the right way?

Overcoming my Personal Fears

Initially it was a challenge to get over the hump each week but I usually made it OK. I think that in my early days in New York, I was becoming accustomed to a different school culture. I put on a brave face but was nervous almost every day. Over time I adjusted to the students. My accent was often a foot in the door. “Hey mister what sort of accent is that?” My standard reply

"Australian. What is your accent?" There was usually a long, thoughtful pause followed by the confident reply "We don't have an accent."

The kids were mostly friendly and accepting of my differences. Some students took a long time to even talk to me, but most would let the barriers down in time. Sometimes I would show them the colorful Australian money or pictures photos on my phone of kangaroos in my brother's back yard. It didn't always work, but more often than not, it did.

Many students in NYC public schools have been exposed what the Center for Disease Control calls adverse childhood experiences (ACE). ACE are categorized as acts of commission such as sexual abuse, and acts of omission such as physical neglect (Center for Disease Control and Prevention, 2018). The list of these is long, and for many students, can present a substantial barrier to learning. One consequence of ACE is that students exposed to such experiences often suffer mental health issues that manifest themselves in the classroom as bad behavior, or as a learning disability. My personal experiences as an educational consultant, as well as my conversations with many, many teachers see this as an enormous issue that is beyond the scope of this dissertation, but nonetheless impacts on the daily work of NYC teachers.

The NYC DOE has a wide range of responsibilities some of which I had not even considered before I came to New York City. One of these responsibilities is to provide education for the large number of young people in jails and correctional facilities that exist in numerous locations around the city. Of these, one of the most notorious is Riker's Island. This jail, located just north of La Guardia Airport has a history of violence and mismanagement. Currently the De Blasio administration is in the early stages of shutting it down and rebuilding a series of smaller complexes to house the prisoners. In the story to follow, we get a brief taste of life inside Riker's Island.

INSIDE THE BOX

On Sept 6, 2016, ABC News Nightline reporter Diane Sawyer visited Rikers Island jail in New York City to film *Inside the Box*. Some of the background information in this vignette is taken from this episode. The rest is from my own experiences at Rikers.

The afternoon sun poured into the small cluttered classroom. I continued to work for a few more minutes enjoying the peace and quiet. Actually, it was very quiet. Where was everybody? I got up and walked around – not a person in sight. The doors were securely locked.

Figure 4 The Prison Bakery. Joseph Ax, Reuters Mar. 20, 2017, 6:46 PM

I looked at my watch and it was after 4 pm. A feeling of dread washed over me as I contemplated the idea of spending the night on Rikers Island. I eventually found an open window – free! Well almost. I now had to walk back along the long hallways and through the checkpoints to get out. In subsequent visits, I was much more attentive to the time!

Early in my career as a mathematics education consultant to New York City schools, I was allocated one day per week at Rikers Island at the Island Academy, one of the two high schools on the island. The Island Academy is located in a series of domed structures from which you look straight across to La Guardia Airport. The irony of having a symbol of freedom and escape

so close to a prison was not lost on me. The schools are administered by District 79. This district is charged with creating alternative programs and schools for students having difficulties in a traditional school. The district is also responsible for educational programs in correctional facilities such as Rikers Island.

Rikers was established in the 1930s for inmates 16 years old and older. Most of the 10,000 or so inmates are people awaiting trial. The rest of the population includes inmates with a sentence of one year or less. Whilst the average stay in Rikers Island is about 50 days, there have been extreme cases, such as Kalief Browder, a 16 year old arrested in 2010 who served almost 3 years at Rikers without having ever been charged with a crime. He later committed suicide. (Berman, 2016)

The detainees are almost all people of color. Many students at the Island Academy and the Horizons Academy are attempting to get their General Education Development Certificate (GED), but only about 4% of eligible students attend one of the schools.

Arriving at Rikers in the morning is a slow and tedious process. You park in the carpark on the Queens side of the river and catch a bus across what the detainees call the bridge of pain. You then go to the first check point at which the paperwork is almost always lost or missing. After a long wait and time spent convincing the officer that we come here every week, we are eventually allowed to the second checkpoint where we surrender our phones and computers and pass through a metal detector and some huge and very intimidating metal gates. Once inside, we do the long walk down the hallways towards the Island Academy, past inmates in orange jump suits with stripey pants mopping the floors, down the stairs, and across some open ground to the Academy huts.

Once inside the school, it all seems remarkably normal. There is small office for the school administrator (an assistant principal). This guy was a character. He had a PhD which he proudly had emblazoned on his nameplate. He was always tuned into Rush Limbaugh, who was going on endlessly in the background. He welcomed us with open arms, and really was a decent guy (despite his listening habits).

The classrooms were full of students in prison attire. Most were polite and engaged in the work. I began to think that perhaps this wasn't so bad. I've seen regular city schools that don't function this well! Without warning, a fight broke out in the classroom. Within 60 seconds a team of armored officers began charging in - spraying something in the room. They bound up the offenders' hands and feet, and literally dragged them off down the hallway. I could see why most students behaved so well!

I wondered what these kids did to deserve being locked up in this place. I also thought about the impact institutions such as Rikers have on the children who are imprisoned there and their families. This episode is now over for me but for the 10,000 or so people locked up in this soul-destroying place, I wish them luck.

A Private Talk

I think that it is important to be clear about my roles, both official and unofficial. Officially, my role was mathematics coaching, but unofficially, many teachers needed someone outside the system (who nevertheless understood the system) to talk to. Russell was a classic example. He was a special education expert with considerable experience as a teacher and quasi administrator. He liked to talk a lot, but was a very decent person. One particular day, he wasn't looking as cheerful as usual. He was always at work early and often stayed late.

When he saw me walk in the door he immediately saw an opportunity to unload a few of his troubles. At this stage I had visited the school about three times.

Russell Hi Martin, can I talk to you for a bit?

Martin Sure. What's on your mind?

Russell You need to understand that the math department is a very dysfunctional. We have meetings and we don't have any protocols. People talk over me all the time. In fact, this whole school is dysfunctional. Only 50% of our math teachers are competent. We don't even have proper curricula. I work really hard and get awards all the time but that's not what I'm looking for. We have so many demands on our time that nothing gets done. This is one of the worst schools in the city.

Martin Why do you say that?

Russell Most of our kids are level 1. Our kids are years below grade level and no one knows what to do. I was offered a job as AP but I decided to stay as a teacher and moved to special education. People here hate the principal. You've been here a few times. What do you think?

Martin It's a bit soon to draw conclusions but I think that you have a lot of challenges.

Russell The superintendent comes in and criticizes everyone. What do you think of us?

Martin I think that you all seem to work hard under difficult conditions. What does the super criticize you for?

Russell Not me particularly, but he says that our classrooms are noisy and that we are too teacher centered. I've been teaching for 11 years and I still get criticized.

Martin But you have won awards?

Russell I just feel like we are the whipping boys.

Martin I have to go to a class now but let's talk again later.

I think that this conversation underscores the lonely job that some people have. Like Russell they are neither teachers nor administrators, but they are doing a bit of each. They do not have the comradery that regular teachers have and are often seen as part of the administrative team by the other teachers.

It's Good to be Appreciated

Santino is an experienced mathematics teacher in grade eight at a Manhattan middle school. He has an outgoing personality and is originally from the Dominican Republic. His students love him. At our first meeting, he was very unsure about yet another person coming in to tell him what to do. After many years in the game he has seen it all, and is skeptical about every new messiah that comes along.

Santino values the special relationship that he has with every student, and you can see this in the classroom. His students smile and take part in the classroom activities. He has high expectations but delivers his instruction with humor. He will not tolerate bad behavior, but it rarely happens because students like and respect him.

Today's lesson is about using elimination to solve systems of equations. What is his secret? Do his students do well? Can other teachers learn from him? His lesson agenda involves giving students some problems, and then, after they have had a chance to do the work, the class engages in an animated discussion on the work that they have done.

Late in the lesson the district superintendent walked into the classroom, and stays a few minutes. As he is leaving he makes one comment – the class is too noisy. The teacher looks at me and shrugs his shoulders. Not a word about all of the good things the teacher was doing. So often teachers are evaluated both formally and informally from a deficit perspective that they come to expect it. There seems to be little effort from the evaluator to understand what the teacher is trying to achieve.

Let's Blame the Teacher

I saw Erica across the hall. Normally I get a big smile and a wave. Today her head was lowered and her smile absent. Erica is a teacher I work with in a large high school in New

York City. She is Chinese American and teaches mathematics to all students but has a number of classes with non-English speaking Chinese students who attend this school. Erica is a hardworking, dedicated teacher.

As we spoke, her concerns began to unfold. Erica had been allocated two large, new classes. Both classes have many students in need of considerable assistance. “What will I do?”

Despite my years of experience there was little I could do but listen. Afterwards we discussed some strategies that could help, and I offered to come to these classes on the days that I was there. I also agreed to assist with planning whenever I could.

A few weeks later I again saw Erica in the hallway as she waited for her class. Following her lesson, we talked. I was keen to see how her new classes were going. She said that things were not too bad and that most of the kids were doing OK. She was clearly distressed and we talked for a while.

> The principal came in to evaluate me. She told me that my students’ scores were not high enough and that she was going to talk to the superintendent about my performance. I am very worried.

Despite all of the good things that Erica is doing, she is being penalized for what is clearly an administrative blunder. When we look at data quantifying teacher attrition rates, and we wonder why it is so high, we can look at examples like this and know that the gotcha mentality is rampant in New York City Schools. Since our last meeting, Erica has applied successfully for a teaching position in a Westchester County school.

This outcome really brings home one of the reasons why teacher attrition is so high. It is attractive for NYC teachers to go to a Westchester County school because the salaries are generally higher, and the working conditions are often better. The cost of this loss is both human and monetary.

THE DONNA DILEMMA

I recently spent time in a middle school classroom in Manhattan. The teacher, Donna was a fireball of energy and was one of the few in this particular school whose classroom management skills were beyond question. I sometimes forgot that I was a professional adult as I fell under her spell and became one of her students. I drifted back in time as I relived my school days in the 60s and 70s. This classroom was a time warp with almost identical methods, strategies, and learning theories used by my primary and high school math teachers.

Donna was like many middle school math teachers I work with. Her content knowledge was patchy. She was scared of change, has been exposed to numerous PD sessions of various types, and blames the fact that 90% of the students at her school are below grade level on the fact that kids are forced to do group work, learn cooperatively, explain their thinking, and all of these other "crazy things that allow the discipline of the class to break down".

As dated as they may be, many of her methods seemed to be working very well in her grade six math classes and at this moment in time. I did however, often feel very concerned about her instructional approach. I imagined just how good she could have been.

Despite our different standpoints, I enjoy talking to her immensely. She is not afraid to disagree with me or anyone else about pretty much everything, and yet, despite our differences, the thing that I admire most is her tenacity. It is her life's mission, in the brief time that she has left in teaching, to ensure that every student in her class knows how to sit up and pay attention, how to dress appropriately, how to take notes, and how to behave in class. Her students try to remember the endless procedures that she has devised for them, often without success.

Donna always scored highly in most areas of her teacher ratings. Her classroom was beautifully set up, she had posters on the walls, examples of student work were displayed for all

to see, and students were well behaved. Almost all of the criteria that the principal was looking for could be seen in Donna's classroom. Neither the principal nor assistant principal were mathematics people but they knew the instructional side in Donna's classroom needed work. Donna believed that if kids couldn't do something, then it must be retaught the same way until they got it right.

Teachers have so many things thrown at them that in many cases they end up staying with what they know, what feels comfortable, and what is manageable. This particular school insists on the use of transmissionist tools such as the workshop model to deliver lessons. The superintendent wants to see differentiation but is vague on what this would look like in the classroom. Donna has her own brand of differentiation. She knows every student by name and nature, and the students know that she will stop at nothing to get the job done. Donna's reliance on procedure completely bypasses the meaning making process, and often leaves students unable to apply their knowledge in different areas.

Koeno Gravemeijer, (2004), discussed the problems involved in procedural learning. He said that these steps make sense to the expert, and that the performance of the expert is taken apart and laid out in small steps, and a learning hierarchy is constituted that describes what steps are prerequisite. The instructional design principles of the 1960s and 1970s were not generally compatible with instructional theories that are based around making meaning and personal input from the learner and instruction that helps students to develop their current ways of reasoning into more sophisticated ways of mathematical reasoning.

Freudenthal, the Dutch researcher and mathematician who is credited with the instructional theory known as Realistic Mathematics Education[20], had as his credo 'mathematics as a human

activity' (Van Den Heuvel Panhuizen, 2003, p.11) and not the transmission of mathematics as a pre-formed system.

The diversity of ideas and expectations, while healthy, presents many challenges for those working with teachers. What are we trying to achieve? How do we deal with conflicting expectations? How can a person in a coaching role provide what is needed to teachers and students to get the best possible outcomes?

Beverley Showers and Bruce Joyce (1987) produced a number of articles in the 80s comparing research in coaching, mentoring and staff development. Whilst the research environment in the social sciences at that time was dominated by positivist methodologies, their thinking was clearly looking at a distant light that was leading them on a path that would free up social science researchers from the shackles of positivist chains. They could begin to see that there are many ways to do research, and that so many things that were seen as contrary to 'real' research in a positivist paradigm, can in fact be assets in research in the social sciences. My research is inclusive and divergent, and I do not discard data that does not conform.

Despite the fact that there has been considerable research that supports student centered dialogic models, and that practice based on this research is evident in countries such as Holland and Japan, and that such practice has been advocated by the NCTM for decades, a significant amount of the practice in mathematics teaching and learning in the US is still based on transmissionistic models rather than constructivist/socio cultural models. Many students are still doing math in an environment that almost completely bypasses the meaning making part of learning mathematics.

Donna is revered by her principal. She is seen as a model teacher in every area except instruction. As stated earlier, Donna's scores are poor. She has great attendance, her students are

well behaved, and she requires very little assistance from outside the classroom. Her students are well mannered and always wear the correct uniform.

When I first met the principal of Donna's school a few years back, she asked me to look in on Donna. She told me that Donna was a very good teacher but asked me to see what I could do about her scores. At the first opportunity, I met with Donna and offered to come to her class and work with her. I wasn't prepared for the diatribe from Donna, who has taught grade six math for over thirty years.

Donna: Did she put you up to this? Did she complain about me?

Martin: The principal did ask me to work with all math teachers at this school. She didn't complain about you, but she was concerned about the poor performance of the students in tests.

Donna: I've been doing this job since she was in diapers and I don't need any help from you.

Martin: I would really like to see your instructional approaches and share some ideas with you.

Donna: I have a prep period now. Come into my room and we can talk for a while.

This discussion highlights some of the challenges that those working in a support role have to deal with. There can be initial suspicion of the coach's motives. This can vary in intensity depending on the teachers' relationship with administrators.

We continued to talk for the whole period. It was obvious that she was passionate about her work, and that she was a no-nonsense kind of person. I began to consider my options with her. Like other teachers who we will meet a bit later, Donna let her guard down as we got to know each other better. I felt that she really needed an outsider to talk to. At that point she wasn't interested in dialogue. She just wanted to tell me her troubles. I patiently listed to her talk, and really did try to understand where she was coming from. She put up her strongest case for direct instruction.

Donna: I read an article that said direct instruction was the most effective model of instruction. I felt vindicated.

Martin: There are also plenty of articles about mathematics instruction that don't support direct instruction as the primary mode.

Donna: Maybe so, but these kids need someone to show them what to do.

Martin: How about I come into you next math class and then we can talk about it.

Donna: OK, but don't you be putting ideas into their heads!

Martin: I could coteach with you if you like.

Donna: Let's play that by ear.

Martin: I'll see you period three.

Donna: I guess you will.

This conversation set the scene for many classroom visits. Donna was a walking contradiction. Whenever I visited her classroom, she wanted to have long conversations both before and after. She seemed to want my approval, but definitely didn't want any suggestions from me. Donna insisted on absolute obedience from her students, and yet, when she attended math meetings she was obstructionist, and inattentive. I felt that the other teachers respected her, but didn't feel respected by her.

Here was a teacher who over the years had built a strategy for instruction that she felt worked for her. Her students learned the importance of respect including being on time, raising their hands, not talking when the teacher was talking. They learned that not doing homework was a guarantee that Ms. Donna was going to get on the phone to Mom and/or Dad. I began to question my own axiologies when it comes to what matters in the classroom.

What is more important? Is it better to learn important social norms than to have effective instructional practices? The things that students were learning from Donna were invaluable. They learned punctuality, manners, and respect, they just weren't learning much mathematics.

Challenging My Own Beliefs

A few years back, I was working in a large school in Manhattan. The school was classified as a renewal school and as such, was entitled to extra support. Most of the teachers were young and inexperienced. The principal was a former Marine who wore black suits to work each day. I was allocated about three days a week at this school (which is much more than is usually allocated to a single school). The school had a majority of students at levels one and two (students who did not meet the minimum standard).

The work was challenging for me and for the teachers. We were regularly visited by senior department officials to review the work that was being done. I had always felt that my relationship with all of the teachers that I worked with was good until one day, one of the teachers (he was also the union representative) said to me "You treat us like idiots".

I remember at the time being pretty upset by this comment, and it remained at the back of my mind. I organized a meeting with him to better understand his concerns, and to explain my own position but we left the meeting without any resolution. A few years later, (2010) I began my studies in the Urban Education program at The Graduate Center in New York City. I began to learn about cogenerative dialogues, radical listening, the Belmont Report, the Authenticity Criteria, the idea of hermeneutic phenomenology, and the negative effects of positivism. It occurred to me that for years, I had been operating in a vacuum. I always worked hard to keep up to date with the work I was doing, but then, in the professional development phase of sharing, it was a one-way street. I couldn't understand why some people weren't on board with the things I was saying.

Why Did You Pick Me?

As I began to seek out teachers to share ideas with, it rapidly became evident that most teachers were very keen to give their side of the story. I was lucky enough to have a ready and steady supply of offers. It is important at this point to understand how participants were selected for this research. When people are selected, the first person will be one that catches my eye for whatever reason. They didn't need to agree with me. They did need to be available for cogens and be prepared to follow through. The second person will be selected serially and contingently and so will be different than the first in their ontologies, axiologies, demographics, teaching styles, gender, age, and personality.

The rationale for this is that all teachers have the potential to be included in the research. By reaching out to teachers because they are different to those already selected, we are making a point of including those who can contribute to a better understanding of what is happening

RAHID'S STORY – IT HAPPENS TO PRINCIPALS TOO!

I first met Rahid in 2003 when he was a new assistant principal. This young African- American guy was a man on a mission. Within a short time, he had established his own school in the same building. He was a man in a hurry.

He asked me to join him as a mathematics education consultant but also to assist with data collection and analysis. I lost track of him for some time until recently, I was allocated some days in a high school in Brooklyn. When I walked in the door, I saw a familiar face, and a full head of now gray hair. It was Rahid, the current principal. This school had partnered with a number of colleges and was incorporating courses that gave students access to college credits as soon as the students had met the required benchmarks.

The school model known as P-Tech (Pathways in Technology) has been adopted by New York State and has been replicated across the US and even as far away as Australia. Whereas most high schools in New York City have a grade 9-12 model, this school has a unusual 9-14 model. The school is unscreened, and so the eligibility criteria are the same as any regular public high school. The goal for the diverse student population is 100% completion of an associate degree within six years of entering high school. (NYSED website, 2018)

We sat down to talk on my last day at this amazing school. As I said earlier the dark hair had given way to a bunch of very grey hair (still in dreadlocks!), but he still had the same sparkle that I remember from earlier days.

"Where has the time gone?" he said as we sat down on my last day. I said that it seemed like yesterday when we first met, and yet, it also seemed like an eternity.

Working in New York City schools is a challenging, draining, but often exhilarating experience. The job of being a principal in a small school might sound easier than the same job in a large school, but small schools have just as many things to do, and less people to do them.

Rahid has bent the rules since day one. He has never believed in the status quo. He often told me in his younger days that he could do it better! Maybe you could say that he has stretched the rules, but he has never accepted that giving up is an option. He grew up in poverty, and overcame many obstacles to get his education and a good job. He became passionate about helping young men of color, who he saw as the most vulnerable of the minority groups. He has strived since day one to look outside the box. This is in a system that has deeply embedded protocols where there is only one correct way to do things, a worldview that has a framework of ideas and beliefs through which those who assess the work of others in the DOE, interprets the world of teaching and running schools. This crypto positivistic approach rears its head at every

level, and it is only people who can push through the hegemonies embedded in the system that will survive with their integrity intact.

As an example, Rahid confided in me that despite his numerous awards and outstanding performance he is still rated poorly by his superintendent. Rahid is not toeing the line. His classrooms are different. His bulletin boards are not how they should be. He laughs as he tells me, but I know it is a challenge because the only thing that is saving him is the high graduation rates. What he does works!

Hang on! Isn't that what we are trying to achieve? Getting kids ready for college and career? Providing a learning environment that makes kids want to succeed? I thought of a different scenario where the superintendent sits down with the principal and says how good these results are, and how can I help you in this great work?

Interestingly, Rahid's school was visited by President Obama because it was considered as a model school. Rahid was seen as an innovator, and his school was a show piece for the city. This still wasn't enough to get him good ratings!

Once again, the dominant worldview is eclipsing reason. Intelligent and hardworking people who have the temerity to use initiative, are being stomped on. Instead of treating people like colleagues, people at all levels are being forced into a very narrow conformist way of thinking. As Rahid sits there with a resigned look, I wonder what crazy, yet exciting idea he will come up with next.

Introducing Marissa

I have been working with Marissa for about 3 years. She is a young middle school mathematics teacher. She has taught mathematics for about 5 years. Her family is from Dominica, an island republic in the Lesser Antilles archipelago in the Caribbean Sea. Dominica is a mountainous

island with natural hot springs and tropical rainforests. The country also lay in the path of this season's numerous hurricanes and was devastated by their onslaught.

Marissa is an inspirational teacher. She currently teaches grade seven. She has made a point of getting know each student and has set high expectations. Each student knows that they are valued. She is committed to being the best teacher that she can be. We often just sit and talk about teaching and feed off each other's ideas. Some of these conversations (cogens) were recorded and are presented on the pages that follow.

Introducing George

George is a vocal, even outspoken high school mathematics teacher. He has been teaching for about 30 years. We have worked together for about 5 years. His school is one of the few remaining mega high schools in the New York City school system.

George is of Greek origin and is very connected to his heritage, particularly the proud history of Greek mathematicians. He is a career teacher, who during our initial discussion about being part of the study, looked down and said that the direction that teaching has taken is one of his greatest disappointments.

As the union representative, he is frequently at odds with administration, and confided to me that he is worried about his future in education. His teacher ratings have fallen below standard and instead of completing a long and successful career (we will explore the meaning of success later), he seems destined to leave the profession unhappy and unappreciated. My feeling is that I would really like to hear his story, and understand the numerous junctions, twists, and turns that have made up his long career. As we talked, I could see some of the old fire reigniting. This is a man with passion.

Chapter 2 gives a snapshot of the diversity and challenges that are faced at all levels in urban schools. Whether you are a principal, a teacher or a student, and whether you are in a regular school, or in a detention school such as Rikers Island. This chapter also examines my own experiences and the early life that shaped my own thinking and beliefs, and helps explain my struggles with the way the New York City school system handles diversity.

CHAPTER 3 MARISSA'S STORY

Chapter 3 is an opportunity to go inside the classroom of a middle school, and to see a middle school mathematics teacher from the researcher's perspective as well as the teacher's perspective. What I was trying to show was how cogenerative dialogue works when participants learn from each other and move on to a praxis that embodies the best of both sides.

Marissa was my first choice as a major participant in this research. Her story is important to this research because she demonstrates what can be done despite the many obstacles that have to be overcome. She believes in herself and her colleagues. She knows that there are often many ways to get the job done, and she is always willing to be a part of the dialogue. Marissa does not hesitate to challenge embedded practices to get a better outcome for her students.

Sometimes you are fortunate enough to cross paths with some truly amazing teachers – of which there are many. Marissa is an example of a hardworking and motivated teacher who is blazing her own trail through a minefield of positivist mines, and seeing success as a direct result of her hard work and insight. Although this chapter is about her, it is also about the great number of teachers like her who are making a big difference in our schools.

Math Can Be Fun!

It was Pi day. The grade seven math teacher, Marissa, had a bright smile and a knowing look. She got the kids settled and informed the students that, as advised, they would be competing to see which student could recite the greatest number of digits of Pi. One by one they lined up and gave it their best. One student was assigned to verify each attempt. Once the student efforts had run their course, the room became quiet. A small voice from the back of the room broke the silence. "What about you miss?"

Feigning surprise, Marissa slowly walked over to the middle of the room. She waited – just long enough, and began to roll out the digits, gradually accelerating through groups of numbers. The students were in awe of this spontaneous and wonderful recitation and sat silently, listening and appreciating this teacher from another world.

3.14159 26535 89793 23846 26433 83279 50288 41971 69399 37510 58209 74944 59230 78164 06286 20899 862…

Ms. Marissa had gone in excess of 80 decimal places before she came to an abrupt halt.

The class cheered spontaneously. *She is our teacher!*

Marissa's Background

The pride the students felt for her filled the room. Marissa is a product of the New York City public education system. She originally began her tertiary studies as a psychology major, and began studying developmental psychology. At the time she had three little cousins aged 3, 6, and 9, and she could see the work that she had done in college making sense as she watched the kids. She later did an education course as a way of completing her credits. Whilst studying the education course she had an epiphany. This was what she was meant to be doing. It spurned her on to do more work in that area, and ultimately to do a master's degree in education. "I guess I always wanted to work with kids at some point."

We had a number of audiotaped discussions that were initially a bit stilted but soon settled into a regular dialogue. Sometimes I would think that we were finished and turn off the recorder, only to find that some of the best conversation happened after we had stopped recording. I soon learned to just let the recording happen.

Martin: I am kind of interested in how you see the school system. It's successes and failures, and what counts as success.

Before she answered she looked straight at me. This was clearly a contentious issue

Marissa: I think that there are problems at so many different levels. They exist at the administrative level, at the district level and at the school level. Every single level has its own set of problems and they just feed off one another. I think that is what upsets me the most. It should be one cohesive system. There is also too much pressure on assessing kids.

Martin: I know. Anything else?

Marissa: There is a lot of pressure on the teachers. I want to make sure teachers are doing their jobs and kids are learning. I don't think there is much of a focus on the kids. Student achievement should be the primary focus. At the moment it seems to be the last thing that we focus on.

Martin: In terms of being a teacher, do you feel supported?

Marissa: There are many opportunities and if you take advantage of them you can learn a lot. Specifically, even though I have a leadership role, I don't feel that I'm allowed to use my skills. I want to make sure teachers are doing their jobs, but I also want to make sure that kids are learning.

Martin: So what's getting in the way?

Marissa: I think administrators have a different focus. We don't see eye to eye and I'm not allowed to go my way. I would also like to meet with other teacher leaders and share ideas.

Martin: Can you be more specific?

Marissa: Student achievement should be the primary focus. I like that I can do leadership work but demands from administration are getting in the way. Maybe we should listen to each other more. Then we would probably see that we are trying to achieve the same thing.

Conflicting Roles

Marissa also has another hat to wear. She is the union representative for the school. So many times I have seen this very unforgiving work, as almost guaranteeing conflict with the principal. She also sometimes has personal conflicts compounded by the nature of this role. She told me that sometimes she is asked to support a teacher who she knows hasn't done the right thing. This creates a situation that is really stressful for her, because she has such high standards in her own classroom, and it potentially sets up a conflict with the principal. Given that Marissa's relationship with the principal is already tenuous due to a number of other conflicting issues, the role of union representative is doing little to help.

What Marissa is expressing here is a common theme. Teachers who are motivated and hardworking, can sometimes be undervalued, and not allowed to stretch their wings. I'm not sure whether it's a trust issue, or just a case of at each level, people trying to appease those above them. What I see though, is that some of the best teachers are being held back and are becoming frustrated by the system. How can we get around this?

It was my job to work in a teacher support role in this school. It wasn't any easy place to work. Sometimes you can work in a school where you are welcomed by all math teachers, and other times it can take a while to settle in. The one real solace at this school was Marissa. Whilst I was there as her coach, I often felt that I was learning as much from her as she was from me. She always welcomed new ideas and theories, and always gave things a try. I would suggest something and she would add to the idea, and maybe I would add some more. I recall one day we were talking about mental math skills and how poorly students had done on percentages in an earlier quiz.

Marissa: My kids always struggle with percentages. They don't seem to understand no matter how much I try

Martin: I have an idea that might help.

Marissa: OK – I'm listening

Martin: If we can get kids comfortable with the idea of finding 10% without using a calculator, then we can use this as a stepping stone to other percentages such as 5%, 20% etc.

Marissa: So what is your strategy?

Martin: We put a bunch of quantities up on the board, and ask the students to find 10% of each one using any method, even using a calculator. You need to do quite a few, probably 10 or more. You then get the students to look at the original quantities and compare them with the answers, and come up with a pattern.

Marissa: I love it! They can all calculate a percentage but they don't really understand what they are doing. We can use 10% as kind of a unit rate and build from there!

This was typical of Marissa. She was a sponge who loved new ideas and was always willing to try them. Often she would invite me back into her class when she was implementing a new idea. I have a sneaking suspicion that she already knew some of these strategies, but if she did, she never let on! Marissa made me reflect on one of the problems that coaches and consultants have. The brightest and most enthusiastic teachers are the ones most willing to take on board new ideas. They are easy to work with and so we tend to gravitate towards them.

The experience of working with Marissa also reminded me of how authentic inquiry through the lenses of the authenticity criteria should benefit all participants. Authenticity Criteria are about achieving fairness through a hermeneutic dialectic process. This is achieved by seeking out all stakeholders and identifying their constructions, and open negotiations with stakeholders of recommendations and of the agenda for subsequent action. Thus the work with Marissa is an example of educative and tactical authenticity.

Martin: In terms of being a teacher, what structures are in place that make you want to stay in the classroom?

Marissa: Generally, I think that there are a lot of good programs for teachers. These include master teacher, model teacher, peer collaborative teacher. I am not ready to leave the classroom probably for at least a couple of years. Even though I have a leadership role, but I feel that admin demands are derailing me. For example, I want to do a study group with teachers from each department but it just didn't get off the ground.

Martin: Do you think other teachers feel valued?

Marissa: I think morale is really low, because whenever we offer advice or suggestions, they aren't taken seriously. The problem is compounded because the principal is new this year and is still feeling his way.

Martin: I guess we can talk about math for a while.

At this point Marissa's face lit up and she became very animated.

Marissa: Yay! That's my favorite!

Martin: So I really enjoyed the question that you did this morning with your grade 7 math class. Do you want to tell me a bit about the question?

Marissa: So I was looking for an open task about circles. The question (shown below) asked for students to say which diagram had the greatest shaded area where each square was a unit square. What I wanted the students to do, was to just look at the diagram and think about which one would have the greatest shaded area. Before they reached for a calculator, and then share their ideas before going ahead and doing the calculations necessary to answer the question. I know that there are lots of ways to solve this so I was curious to see how the kids would do it.

I knew that we had done work on area of a circle, and they knew about diameter and radius so I wanted to see if they could apply this in a non-routine sense.

Martin: Do you think it went well?

Marissa: I think it was very successful. I wanted the kids to struggle for a while, make inferences, and think about strategies. I wanted them to work out a way to solve it by applying routine knowledge in a non-routine question.

Martin: This is a great question. I heard you say earlier that you could give this to any grade level from 6 upward and we would see a full range of solutions.

Did you learn a lot from the students' work?

Marissa: Yes. I found that students had a variety of strategies that were nearly all viable. Some involved measuring, some involved ratios, and some involved straight calculations. I did this with two classes and the process involved a great deal of targeted questioning. I felt that this question motivated students even though they were initially taken back by the type of question. I want them to build confidence in their own ability.

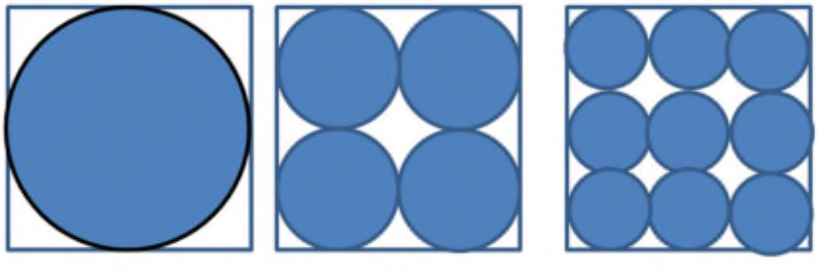

Figure 5 – Circles in a Square

BEING A TEACHER | RESEARCHER

Listening to the audio recordings and thinking deeply about them, I realized that much of what she was saying, I had missed during the initial conversation. Maybe I was thinking about my next question. There is so much more in what Marissa was saying than I had initially heard.

It reminded me of a recent classroom visit at a different school where the teacher had taught a lesson on order of operations. The students seemed attentive and everything seemed good. Following the instructional part, the students were given some questions based on the lesson that had just been taught. I walked around the room, and only a small number of students demonstrated any understanding of the work.

What are the implications for teaching? How can we escape the transmissionist model and get students learning with understanding?

I had always thought about Marissa as a teacher, but after listening to her talk, I can see that she is a researcher, and a teacher, or in the terms of Konstantinos Alexakos (2015), a teacher | researcher. Everything that she does is about becoming a better teacher, about learning, changing, and understanding what works. She is prepared to take a risk and break away from the accepted instructional methods. Her students know that she expects them to try, and persevere.

My sense from working extensively with Marissa is that some teachers are successful despite the numerous barriers that could include difficult administrators, evaluations, logistical problems such as class size, clashes in beliefs, workload, and the numerous other things that teachers have to face. I could only begin to imagine what she would be like in a more collegial atmosphere.

SUCCESSES AND STRUGGLES AS A STUDENT AND AS A TEACHER – A FINAL WORD FROM MARISSA

As a student I was always really good at math. I was a good listener and I could watch someone do something and memorize the steps. That is actually how a lot of math education was for me in the past. It was simply a set of rules and steps that I was generally good at following.

I think my experiences as a math student ended up being my greatest setback as a math teacher. When I first started teaching, I thought I was great! I was really good at simplifying procedures and writing steps in a clear and concise way. Many of my lessons followed the workshop model structure and I was creating a room full of robots. When a student did not get something, I would just model it again and give them more practice.

Teaching mathematics is when I actually started to develop much of my own understanding of topics such as proportional reasoning. I would prepare lessons and think to myself "so that's why cross multiplying works!" As a child, and even as an adult, I never understood the concept. I just knew the steps.

I am so glad all that has changed. I really believe it was my experience in Algebra for All[21] and my learning at Bank Street that sparked the transformation in my view of mathematics education. I started to develop a true love and passion for mathematics and I was excited to share that with my students.

After about my third or fourth year teaching, I began to notice a change in my teaching style. I slowly moved away from modeling skills and focused more of my attention on problem solving. I looked closely at the mathematical practices and used that language to guide my planning of instruction. I took more chances in my classroom and pushed my students to do the same.

Last year felt like my most successful year, thus far, as a teacher. I was so excited about the learning my students were experiencing. They would struggle and work

> through problems for days, at a time. They were eager to share their learning with one another and they were constructing their own knowledge of math concepts.
>
> Right now, however, I feel like I am struggling to recreate those feelings. I am not sure why but I am not challenging my students like I did before. I think I am afraid of their response. I need to look outside of the math and think about how to build my current students into mathematicians. I need to support them through their struggle and set them up with the tools to succeed.
>
> I wonder, sometimes, if my reservations are around being in a new school. I have always prided my lack of concern for others' opinions. This year, however, I feel like I am placing restrictions and limitations on myself because I am uncertain about what my administrators will think. I need to return to the old carefree me and think not of others, but of my students and what is best for them.
>
> As a kid, I was always concerned with what others thought of me. From my parents to my teachers, I always wanted to impress people with my best self. This behavior continued through adulthood and lives within me to this day. However, that one year I did not care may have been my best year yet. As a teacher, I need to stop letting others' perceptions of me dictate my actions. Slowly but surely, I am getting back to who I want to be. If I become more aware of that version of myself, I will only get better as an educator and eventually a leader.

I know that I learned a lot from Marissa, and I think that she learned a lot from me. Cogens are a way for people to not only understand others, but to understand yourself, and hear you own views discussed and combined with other ideas. Sometimes cogens let you hear yourself out loud, and just doing so is sometimes enough to re-evaluate your own stance.

I watched Marissa revise her practice of teaching into a praxis of teaching, whereby she combined her experience, her understanding of student needs, and her growing knowledge of pedagogy from reading, sharing, and listening.

CHAPTER 4 THE DEPROFESSIONALIZING OF TEACHING IN AMERICA

It was around 1840 when Karl Marx and Friedrich Engels wrote the Communist Manifesto wherein there arose a dialectic between capitalism and Marxism which struck fear into the hearts of the ruling class. At the time those in positions of power considered the Marxist philosophy as an attack on feudalism. Marx's philosophy was dialectic materialism – a model which saw the world in constant change. As the working class grew through the industrial revolution, the struggle became one of the working class against the capitalist rulers. (Richards & Saba, no date)

It would seem that as feudalism was replaced by a capitalist society that one oppressive structure was replaced by another. Marx and Engels (1848) said that 'the supporters of reforms and improvements will always be fooled by the defenders of the old order'.

Urban education in much the same way sees much of the old order defended and real change thwarted. The ruling class in education is what we are used to. In this chapter I aim to show what happens when a hardworking highly competent teacher clashes with a rigid positivist system and comes out second best.

Doing the job of teaching mathematics in an urban school is not just about what happens inside the classroom. It is about being allowed to use initiative and be unafraid of the consequences of not being aligned to a particular school of thought. In this chapter I expose the things that can happen when teachers are forced to adhere to a rigid set of rules that have little to do with giving students a great education. Our teachers are well educated smart people who bring to the classroom a wealth of knowledge and diversity matched only by the students that they teach.

WHY WE ARE LOSING TEACHERS

In chapter 1 I talked about the statistics on teacher retirement, resignation, attrition – call it what you like. These losses are very high by any standard. I then looked at some numbers on teacher attrition which have an impact that is hard to quantify. I revisit these for a while so I can bring these objective facts to the forefront as we begin a broad interpretive analysis of the phenomenon of teacher loss and how it plays out in the functioning of the system and the lives of the participants. Later in this chapter I will tell George's story in an effort to really personify the tragic waste of resources and assault on human dignity that is happening every day in our schools.

The loss of people occurs not because they are doing their jobs badly, but because they are not complying with directives imposed by those who believe that there is only one right way to teach. If you disagree in this system, you will be poorly rated, disciplined, and ultimately you could lose your job. Such positivist hegemonic behavior is costing us dearly. People who came into teaching full of enthusiasm, and new ideas, are quickly becoming disillusioned, leaving the school, and often, the profession. Just as we should value the diversity in our student population, we should also value diversity among our teachers.

It is also about collegiality. Being respected as a professional colleague is a critical component of job satisfaction. A principal is not necessarily more knowledgeable than a teacher in a given content area. Dialogue around practice should be as professionals and colleagues, each bringing a unique set of strengths to the table. It should not be as one person being all knowing and bestowing their wishes on the rest of us. Principals should be able to deploy the interests and expertise of all staff in the interests of building a professional community of teachers and learners.

In terms of evaluation, Linda Darling Hammond (1997) said that…

> standards for schools of education are unevenly applied; many beginning teachers receive little or no mentoring; and teacher evaluation and reward systems are disconnected from the nation's education goals (p. 2).

The New York City Department of Education is loaded with talented people who are up to speed with latest research on what good teaching means, but not much of this gets filtered down to administrators, who very rarely have the same information as their knowledgeable colleagues. This is not the administrators' fault. They have a huge workload that often precludes them from such professional learning activities. Administrators do not enjoy the long summer vacation that teachers do, and their decisions are often influenced by their superiors, who are similarly not up to speed with best practice. The nature of the hierarchy is such that the coercive nature of those in power can have a detrimental effect on those lower on the ladder.

TEACHER ATTRITION – AN UNPARALLELED LOSS

Richard Ingersoll (2001), cited data that in particular, shows inadequate support from the school administration, student discipline problems, limited faculty input into school decision making, and to a lesser extent, low salaries, are all associated with higher rates of turnover.

Jeremy Glazer (2017) said that many certified, experienced teachers left teaching after making significant investments in their careers. He examined these teachers through a lens of resistance, illuminating issues of power as well as the ideals of teaching that may be expressed through the decision to leave.

Robert Vagi and Margarita Pivovarova (2016) claim that most work attrition employs one of three theoretical approaches: organizational theory, which focuses on fit between worker and organization, rational choice theory, in which individuals are theorized to act in ways that maximize their 'utility' or satisfaction or self-efficacy theory, with an emphasis on feelings of

competence. But these fail to explain why attrition in teaching is so much higher than in any other profession.

A staff report of the New York City Council Investigation Division on Teacher Attrition and Retention showed that New York City was even worse than the national average, with a two-year attrition rate for teachers of 25%, and with 18% of teachers leaving in the first year.[22] One of the main sources affecting the working conditions of the school is the leadership. The effectiveness or ineffectiveness of the leadership of the principal directly impacts the satisfaction of the teachers in the school (Johnson, et al., 2005).

Recently I worked in a school in the Bronx where the principal would sit in her office most of the day doing the many tasks that principals have to do. She invited me in for a meeting to update my work there. As I came through the door she asked me to leave the door cracked just a little. I looked at her and she explained that as teachers enter and leave the building, they have to pass her door, and this way she is able to check on who is late, or who is leaving the building when they shouldn't.

I had only been there a few days, and it was clear that something was wrong. Sometimes there is some resistance when I come to a new school but here I was experiencing total exclusion. I was only there for a few months but at the last meeting I had with the teachers, they explained that I was seen as a tool used by the principal to get her way. Whilst this can be a fairly normal initial reaction, as people get to know me they soon realize that my job is to support teachers, not undermine them. They were so fed up with the way that they were treated, that there was nothing that I could do to influence them. They said that they were totally disrespected in every way, and that they will do their job, but would not otherwise cooperate in any way. Of

course there are many excellent principals, people who are respectful and collegial, but clearly there are some who are not.

GEORGE'S STORY – A HARD FOUGHT BATTLE FOR RESPECT AND DIGNITY.

Large scale Greek immigration to the United States didn't really begin until the late 1800s, with the largest numbers immigrating during the early 1900s. Bethany Pierce (2018) in her online article Greek immigrants, said that in the first two decades of the twentieth century, more than 350,000 Greeks immigrated to the United States. Most of these were men.

World War 1 came to an end when Germany formally surrendered on November 11, 1918, when all nations agreed to stop fighting while the terms of peace were negotiated. On June 28, 1919, Germany and the Allied Nations (including Britain, France, Italy and Russia) signed the Treaty of Versailles, formally ending the war.

Wasting no time, Georgios Damianos came to America as a young man later in 1919, vowing to maintain his Greek Orthodox roots whilst at the same time building his life in America. He met and married another Greek immigrant Anastasia Akilas. Their first and only child was named Dimitrios. He too was strongly Greek and proud of the blue and white traditions. Dimitrios decided to cement his American roots and married a good Catholic girl named Adelaide, who quickly bore him a son.

A strong tradition in the Greek Community is to name children after Greek saints so that they will forever be under the protection of that saint; but they also like to name the first born son after the paternal grandfather, so when Dimitrios and his new wife had a boy, they called him George. Like his father, George was an only son. Young George's grandparents, Georgios and Anastasia, passed away while he was still a child, and tragically his parents perished in a car accident a few years later. George was alone - very alone, for the first time in his life.

A Long and Distinguished Career

Like many young people, George was not entirely sure what he wanted to do with his life. He had done well in high school and was good at mathematics and science. He tried a number of different jobs including some tutoring work for math and science. At some point he decided to go back to school and get his teaching qualification. His studies reinforced his love of mathematics particularly, and he began to see himself as a career teacher in public schools. George had always attended public schools, and his belief in the system was strong and passionate. He felt that public schools are there for everyone, including all of the educationally underserved students who are rejected by the selective schools. His teachers were amazing, and supportive, particularly his mathematics teacher. His teachers believed in him, and he always felt that somehow, he wanted to give something back. His decision to teach gave him the opportunity to do just that. Deep down, he wanted to follow in the footsteps of his math teacher - a man who he saw as kind of surrogate father.

When you are a loner, life can be a little harder. George saw his job as his life. He never met the girl of his dreams, and immersed himself into his teaching. He believed in service and supporting his colleagues.

The school where George began teaching as a young man in 1988 was a big school. The mathematics department alone had more than 30 teachers. A few years later he was asked to run for the position of union representative. He was already known for his tenacity and strength. He was not afraid to stand up to those in charge when he saw something untoward going on. Whilst this made him few friends in the administration, they accepted that he had an important role, and was acting in the best interests of the teachers and the school. He was a straight talker, maybe too straight.

Nothing is forever. Principals and assistant principals come and go, but George stuck it out. As the years went by, he had seen multiple changes to the system. Curriculum and structure changed. Each one a miracle cure for the ills that had befallen American mathematics education. All George could see was the same kids were being left behind. He threw his back into it and kept giving all he could. The students in his math classes spoke up to a dozen or more different languages. He had students who were disabled, and many of these had individual education programs, or IEPs. He had students in grade 12 who still counted on their fingers (and toes if the numbers got big enough!) Now just to clarify, the description below of the IEP is copied from the NYCDOE website and says that that the Individualized Education Program (IEP) is…

> a written statement of our plan to provide your child with a free and appropriate public education (FAPE) in the least restrictive environment (LRE). The least restrictive environment is where children will be in schools and classrooms with non-disabled peers for as much of the day as possible.

This is important because more time with non-disabled peers is believed to result in higher scores on math and reading tests, fewer absences from school, fewer referrals for disruptive behavior; and better outcomes after high school.

An Overdue Invitation

It was no surprise that when I came along, George closed the door in my face. He didn't know me, but he also didn't want another outsider coming into his room and imposing new ideas on him. I worked at George's school for about six years, and we did get to become friends at some point. He began to share his stories with me, and I began to understand.

Recently George started sharing the news that the current principal was unhappy with him. She had ideas on how classes should be run, and George's classes didn't look like her vision of the model classroom. This principal was a former math teacher, and she believed in the

Workshop Model of instruction. Whilst this model has some good ideas, it is essentially a transmissionist model that uses the 'Tabula Rasa' approach to learning so despised by Paulo Freire (1987). Now you will recall the some of the fundamental components of my research philosophy are polysemia and polyphonia and these ideas are essential components in teaching, learning, and supervision. This principal was convinced that this was the only way to teach mathematics, and she expected all teachers to follow it - kind of a math by numbers routine (excuse the pun!). This approach to teaching and learning was highlighted by Louisa May Alcott (1892), whose father was not only a teacher, but a school superintendent, and a founder of one of the first adult education centers in America.

> My father taught in the wise way which unfolds what lies in the child's nature, as a flower blooms, rather than crammed it, like a Strasbourg goose, with more than it could digest. (p.9)

Teaching Models in Mathematics – Which One is Best?

The workshop model has four basic parts: opening, mini lesson, work time, and debriefing. The opening is an opportunity to share the lessons learning targets and set the stage for the day. During the mini lesson the teacher provides direct instruction for the whole class. During work time, students get to dig in and practice the learning. This is seen as the most important part of the workshop and therefore must be the longest part of the period. You should try to give students the bulk of the class to work, practice, or apply what has been taught during the mini lesson. The debriefing occurs at the end of the workshop and gives students an opportunity to be metacognitive as they synthesize, reflect on, and name what they have learned for the day (Education World, 2017).

While the Workshop Model is a model that would prove useful from time to time, there are many other models for lesson delivery that are effective templates depending on the needs of the

teacher and the particular lesson that is being taught. One such model which the New York City Department of Education and the National Council of Teachers of Mathematics endorse, is outlined in the book 'Five Practices for Orchestrating Productive Mathematical Discussion' (Smith, 2018). This is an exciting and valuable model that essentially gets kids to spend a great deal of their lesson struggling with and making sense of mathematics problems.

There is another model called Math 360, which essentially has students working on a series of whiteboards around the walls of the room. The teacher is able to see in real time where the different groups are heading and use questioning to understand what the kids are doing. Like the 5 practices, groups of students using this model are selected purposefully to maximize the learning experience for all students.

Now it was my job to work with math teachers and help them learn and implement best practice in the classroom. I had worked hard to keep up to date with the various models advocated by the NCTM, and by reputable educators such as Lucy West at Metamorphosis in New York City. Even the NYC DOE itself was advocating for best practice but the message wasn't always getting through. The department currently supports the 5 Practices. (Smith & Stein, 2011).

When administrators do advocate a model like the Workshop Model as the only acceptable approach, it is time for dialogue! I have the delicate task of explaining that it is not always the best option based on our understanding of current research in this area. It is essential for teachers to make dynamic, in the moment decisions both in the planning and in the classroom. We also want our students to make sense of the mathematics and build procedural fluency based on this understanding, not to just repeat an example given by the teacher.

BIGGER IS BETTER - OR IS IT?…

At this point I am going to step away from George for a while to understand how much some aspects of schooling in NYC have changed since he began teaching almost 30 years ago. In fact there are three scenarios – the first, when old practices remain with us for decades or longer, the second is cyclic change such as centralization and decentralization, and the third is change in a certain direction. One major change is the almost complete restructure of high schools, from the days when most high schools were very large campuses that often had in excess of 4,000 students, to much smaller (100 – 500 students) high schools that are more specialized. Schools such as Taft High School (pictured), were unable to cater to the needs of the shifting demographics in the school community.

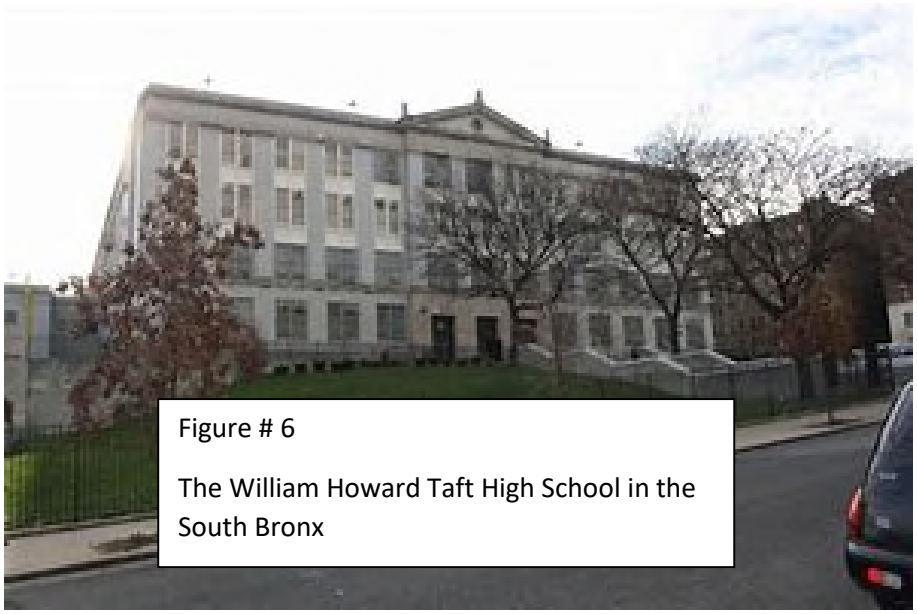

Figure # 6

The William Howard Taft High School in the South Bronx

Citywide, crime rates were high and unfavorable publicity further accelerated the decline of the school. By the early 1970s, Taft H.S. earned a reputation as a "failing school" with many of the same problems as other high schools in low income, marginalized neighborhoods in New York City. (Wikipedia, 2018).

The move from the large schools to small schools was seen by many as a positive move. Nathan Dudley (2017) summarized it as follows.

> Beginning in 2002, with the election of Mayor Michael Bloomberg, New York City's Department of Education undertook an unprecedented overhaul of the largest school district in the United States. Over the next 10 years the Department of Education closed more than 25 large, underperforming high schools, and created almost 200 new, small high schools, which, by the end of the decade, were serving approximately 30% of public high school students in the city. The first classes began graduating in 2006, and many of the "New Small Schools" graduated more students on time than many of the large schools they had replaced, in some cases even surpassing the citywide average. These increased graduation rates played a role in the increase in New York City's overall 4-year graduation rate from consistently around 50% in the late 1990s to more than 66% by 2012.

Stacey Campo (2017) in her dissertation wrote that New York City's former Mayor, Michael Bloomberg and New York City's former Chancellor Joel Klein restructured the school governance away from local authority. They broke up large school buildings by creating hundreds of new small schools, many of them with four to five schools in one building. This movement to small schools was motivated by research showing that smaller schools had better academic outcomes and students were more connected to the school (Hill, 2010). The small school movement had an increased focus on testing. When polices were aimed at educational quality, they had a significant positive impact on community schools.

My arrival in New York City in 2003 coincided with the first wave of school closures. The new schools that I worked in were a ray of hope and were staffed by excited fresh young principals and their teachers. The smaller size did have a lot of advantages. It meant that principals knew their students and staff better and as such could better plan for student needs. At this point principals were redesigned to be instructional leaders, and as such were expected to spend more time in classrooms and work with teacher groups.

The downside for some of these small schools was that they could not offer as great a range of pathways and options. Just offering the core curricula was often a stretch, and required a lot of creative thinking when scheduling for the new year. Many of the small schools did not have resources such as time, money and manpower to do activities beyond the basics. Another problem was that despite their enthusiasm, many of the administrators were inexperienced, and were replacing senior, more highly paid principals. Large high schools also had access to school nurses, psychologists, and other import resources that small schools often struggle to access.

Like Taft High School, many of the existing larger schools were unable to compete with the newer schools that attracted students who had scored highly on the state tests from their area. There was a great deal of criminal activity in the area during the nineties, with the death knell for Taft High School happening in May 1997, when Jonathan Levin, a teacher at the school, and the son of former Time Warner chairman Gerald Levin, was murdered by a former student. When the old school shut down, one of the new smaller schools in the building was named for Jonathan Levin.

Taft High School struggled bravely on but accepted its last cohort of grade 9 students in September 2004. The shutdown, under the stewardship of Principal Lisa Luft, was incremental and was completed when the last students graduated in June 2008. There are similar stories for literally dozens of the old mega high schools. Whilst the buildings remain, the old schools have been replaced by smaller so called ‘specialized’ schools. Essentially what happened was that the schools within schools idea became common with four or five small schools replacing every big school. All that remained of the big school was the building.

The old mega schools[23], such as TAFT, JFK, Clinton, and FDR, were able to offer many things that the smaller schools cannot. They are able to offer a full range of mathematics courses

including advanced placement (AP) in areas such as calculus and statistics, and also offer specialized courses in important areas such as computer programming and robotics. Students were therefore able to enjoy a variety of options, and pathways that are logistically impossible in the smaller schools. They also had subject area specialists for assistant principals.

The thinking by the NYCDOE was that principals were no longer just executives, but were now required to be instructional leaders. Whilst this did help to get them out of the office, it meant that their already high work load was even higher. Large schools have an abundance of assistant principals to cover all major subject areas as well as specialist areas like special education, and supervision. Many of the newer small schools might not even have an assistant principal, or perhaps only one. This meant that the principal had to take on many of the roles that larger schools normally allocate to assistant principals. This in turn, sometimes meant that important tasks such as observations and feedback were abbreviated, and often resulted in administrators missing much valuable information. It also meant that often, assistant principals were required to work outside their area of expertise.

TEACHER EVALUATIONS – HOW EFFECTIVE ARE THEY IN KEEPING THE STANDARDS HIGH?

Paul Murphy and Rachael George in their article on walkthroughs (Murphy and George, 2018), say that expedited walkthroughs often occur without context and regularity, classroom observations can damage trust between teachers and principals, as well as negatively affect teacher ratings.

They give an example where a teacher was rated poorly because one student was not sitting up, one student left the room without permission, and one student was sitting by himself, as opposed to sitting in a group. It turns out that this particular teacher had actually made legitimate

and intelligent choices, based on her understanding of the individual needs of the students. This is what good teaching is about. The teacher later asked the principal why he hadn't talked to her about these students before writing her up.

A Classroom Visit – Finally!

One day out of the blue, I arrived at George's school, and he came up to me and asked if I would like to visit his class today. Having offered my services to him for several years on a regular basis, I remembered the old proverb 'One volunteer is better than ten pressed men'

I was surprised. Not because he was good, but because when you see someone who is really meant to teach, they are at their best in the classroom. George took on a whole new persona as soon as he stepped in to his classroom. His students respected him – this was clear immediately. He knew his students, and they knew what he expected. There was no silence in George's classroom. Students worked on challenging but appropriate problems. I worked with him as an equal. A few times he invited me to explain an idea to the students, which I willingly did. Was this the same man that I had initially found so unpleasant? All too soon the lesson was over. We went back to the math room to talk about the lesson as colleagues who had shared a precious moment in time.

George: Anything I should change?

Me: Are you serious? Listen George, your lesson was a breath of fresh air. I'm happy to come in any time and work with you. Thanks for the invite.

George: They are a good bunch. Need to be pulled into line occasionally but otherwise OK.

Me: I wish other math teachers could see your class.

George: Don't push it.

Me: OK, well thanks for the invitation.

This was an important lesson for me. I had judged this man based on incomplete information. George is a good teacher, and a good person. I tried to convince him that principals come and go,

but it wasn't washing with him. Over time, the frustration began to show. George became impatient, and frustrated. We talked more often now. I was a sympathetic listener, but it didn't seem to help. George became more and more depressed. I thought that he was suffering from paranoia, but I listened to him anyway. He told me that the admin team is putting together a case to get rid of him. I told him that he was crazy because he only had a short time before he retired. Wouldn't they just let him time out?

A CAREER ON THE LINE

George recalled a conversation that he had with his principal a few weeks back. He had been summoned to discuss his poor showings in evaluations. The following is a transcript based on George's recollection of the conversation. In general principals refer to teachers as Mr. or Ms. and for the sake of this discussion I will use the name Mr. George.

Principal: Come in Mr. George

George: Thanks

Principal: I have some concerns that I want to discuss with you.

George: OK

Principal: As you know, my goals for the math department have been to use the workshop model of instruction. I have also requested that teachers use one of the models of differentiation that we have discussed. During my recent visits to your classroom I have seen no evidence that you are complying. I have therefore rated you unsatisfactory in this area.

George: My lesson plans are written for me and the students, and will change as needs arise. Also, I have never been rated unsatisfactory in my life. I work hard to cater to the needs of the students by getting to know them, and adjusting as I need to depending on their individual needs. Teaching should not be a dog and pony show to impress visitors.

Principal: You have also been disrespectful to my assistant principal during an observation.

George: He is an idiot who knows nothing about teaching or mathematics.

Principal: You are not paid to do whatever you want!

George: I thought that I was being paid to use good professional judgement and do what is best for my students.

Principal: One more thing. Your activities with the union are undermining my authority and the authority of my senior staff. You have advised other teachers to lodge formal complaints and this has made my position untenable. I will have to review your role in this school.

George: What do you mean by that?

Principal: You will find out soon enough!

George: I am just trying to do my job and would appreciate a bit more support from you.

Principal: We are done here.

A few days later, George advised me that he had been suspended by the principal and the Department of Education and is in the process of making a decision on termination of his teaching credentials. His (slightly edited) email to me went as follows…

> Hello Martin,
>
> Hope all is well with you and that you will have some much-deserved time off. In July 2018, the principal served me with papers (3020a) for dismissal. I am currently suspended by the DOE and they will attempt to remove my license, so you can imagine how my summer is going so far. I have taught for 28 years at this school. The charges against me are ridiculous. The principal is doing this because of my union activism over the years. I am going through a difficult time so forgive me if I decline to take part in completing your forms (at least for now).
>
> Be well and thank you.
>
> George

I was both stunned and saddened by this news. Could he be hard to deal with? Yes, he could. Did he support his fellow teachers? Yes he did. What is a dedicated career worth? Is a difference in beliefs a good reason to terminate a teacher? After almost 30 years of service both to the students and his fellow teachers, George is leaving the profession that he loves – not with honor and pride, but under a cloud. Instead of celebrating his service with a sense of achievement and gratitude, he is being tossed out, discarded like a piece of trash.

Sitting here thinking about George, and quite a number of good people who have suffered a similar fate, I think about how different the World would be if people could step out from their egocentricity and accept that the crypto positivistic mindset that encumbers so many institutions still dominates much of our World. If George and his principal had both embraced the tenets of polyphonia, cogenerative dialogue, radical listening, and ideas set out in the Authenticity Criteria of Egon Guba and Yvonna Lincoln (1989), then maybe, in a small way, they might have both walked away a bit better off. I recently contacted George again to see how he was going. Here is an excerpt from his reply.

> Good Morning Martin,
>
> Hope you had a restful summer. Yesterday I was removed from my school and temporarily reassigned to another school. The principal, in her usual hatred towards me did this while I was on vacation. My reassignment was dated in July but I was not informed until yesterday morning (mid August). Anyway, it is a long process until this nightmare ends. I may consider helping you in telling more of my story but not at the present time because it may jeopardize my job. A hearing will be scheduled in the near future.
>
> Best wishes
>
> George.

How can a high-quality learning community exist in these conditions? Teachers often come a poor last in schools in terms of being part of a supportive learning environment. What else can we do to build and support diverse and inclusive learning environments in our urban schools?

Chapter 4 was a reminder of the multiple challenges that teachers face in a system that demands that they differentiate for their students and yet sets a single standard by which teachers are judged. I think that I learned a lot in terms of how I can support teachers and work with administrators. In the next chapter we will hear from Mary, George's principal, and get a sense

of where she was coming from. We will also look at a day in the life of individuals such as a teacher, a student, and the consultant/coach so we can see an example of the challenges each of them can face as well as the important role the teacher plays with each of them.

CHAPTER 5[24] A DAY IN THE LIFE OF…

In Chapter 5 I present a series of stories about people at each level in the school, from a student to a principal. My aim is to show a day in the life of people in the urban education system who are not necessarily representative or typical, but who are just who they are. If we take Nona for example, we could say that we have tens of thousands of students just like her, but do we really? Nona's story is truly unique but so are the stories of every other student. What I am trying to show is not how Nona is like other disabled students, but the way teachers and families deal with and try to help every student no matter what.

The public school system has come a long way since 1732 when an act (name unknown) was passed to establish a public school in New York City. In those days the schoolmasters' wages were raised by fundraising from peddlers' licenses and annual taxes raised by the city. Since the days of the first Free School in 1809, a model of public education began to form and children were admitted "without distinction of sect or circumstance." (McCarthy, 2014). This was a quality that set public schools apart and to this day makes them uniquely important. It is important to note that present day urban public school teachers often work for less pay under more difficult conditions than their counterparts in neighboring counties.

When we think about issues that impact us we realize that none of us operates in a vacuum. In order to provide context and to make sense of the social complexity within which teachers and learners work, in this chapter I examine the professional lives of some principals, teachers, and students. The following accounts are not specifically about a single person, but could be a mixture of a number of principals, or a number of teachers, or a number of students, reconstructed from my experiences and interactions in New York City public middle and high schools. Although these experiences are real, they are not necessarily typical. They are just what

they are. These people and their stories are of course selected by me, interpreted by me, and written by me, and therefore are subject to my own ontologies, axiolologies, and epistemologies.

Before we get started we asked teachers what would make their job better, and they came up with some of the following ideas.

> It would be good if administrators treated us like professionals and colleagues. I think this would make us feel more valued, and respected. When someone becomes an assistant principal or a principal, they have more responsibility, but not necessarily more knowledge. It would also be good if we were treated like someone with specialist knowledge. Instead of trying to find what's wrong with us, if people have a question about math instruction or curriculum, they should reach out to us because that is what we do!
>
> It would probably also help if some administrators were up front about their level of expertise instead of pretending that they know more than what they do. We get really frustrated when we have to teach a particular way and we have to put our own ideas aside to conform. School leaders should be open to a range of instructional approaches that conform to best practice.
>
> If school leaders encourage/reward the use of teacher initiative, they might be surprised at the results. Brains aren't handed out at administrators' school! We also want school leaders to encourage risk taking and effort and for teachers to know they are safe and will not be punished because they do not conform to a single / rigid mode of practice.
>
> We do lots of professional development and like much of what we learn at these sessions. In fact we do more PD than administrators do, only to find that what we were shown as best practice, is different from administrators' expectations.
>
> There are administrators with a gotcha mentality. Such leaders don't say anything when teachers come in on the weekends, and stay late after work, but they are watching when they leave five minutes early one day. It would be good if teachers could be seen as colleagues and not as subordinates. They really want to do a good

job but we also want to be appreciated for using initiative, and good judgement. There is a very high turnover rate in this profession and it would seem that a significant cause is that teachers are undervalued.

A DAY IN THE LIFE OF A PRINCIPAL

Having been a principal in a small New York City high school, Mary was astounded when she was appointed as an interim acting principal of one of the biggest high schools in the city. At her old school she had one assistant principal, and about a dozen teachers. She was now in charge of a school with about four thousand students and hundreds of teachers, as well as numerous ancillary staff. Mary was also the principal who fired George.

I sat down with Mary last week and asked her if she could talk about her work as a principal. I mentioned a few things such as evaluations, teacher attrition, and lack of vocational education for those students who were not college bound. The staffroom chatter had painted her as a beast. Her policies were not popular, and she seemed unsympathetic towards the needs of the teachers.

A few days after my initial request, Mary sent word that she would tell me her story. I asked her about the challenges that she faces each day, and we even touched on her reputation with the teachers. It turns out that Mary had replaced an extremely popular principal, who had nevertheless been rated by his superiors as ineffective. She was given the task of sharpening the school up. What this essentially meant was toeing the party line, following procedure, and punitive measures against teachers who were not aligned with policy. Based on discussion with teachers, the previous principal was very popular but had received poor evaluations because he hadn't always followed departmental guidelines. This was not a job for the faint hearted! This is Mary's story.

Mary's Story

There is very little that I do as a principal that makes people happy. This is a big school with a lot of people and I am doing the best that I can. When I was a teacher, I taught mathematics, and I really enjoyed it! Like teachers now, I was frustrated when I was evaluated and it wasn't what I was expecting.

I think that I realize now, that being a principal is not about making people happy. It is about doing the best that you can to manage this very large and complex organization and keep it running smoothly, while looking out for the best interests of the students. Big high schools have a lot going on. We offer more courses than small schools, and we have many more students, so we have more problems. This said, our school is doing very, very well. I wonder some days if we're going to make it, but we always do. You can never afford to let things get to you, but sometimes they do. My priority is always my students, but my teachers are important too.

Sometimes I have teachers who aren't performing and they are being sheltered by their union and that can be tough – but in the end the kids come first. One bad teacher can do a whole lot of damage and I cannot tolerate that, but I try to be fair. Often I am constrained by what the superintendent wants, but it is what it is. As a school we try to prepare all of our students for college, and we know that some of them won't make it, but as long as my teachers are doing their best, I am OK with it.

We have many kids with special needs, disabilities, family issues, victims of crime, or poverty. You name it we have it. Special needs kids are increasing in number every year and it takes a lot of resources to give these kids the resources that they need and deserve. I am blessed with some really great APs, especially my mathematics AP. The APs are my right-hand men and women, without whom I could not run this school. I also have a great team of school safety officers who keep our hallways clear and our school safe. We also have a great bunch of custodians.

Some days, I wonder why I do this, instead of just remaining a teacher, but when I go to graduations, I know that it is worth the effort. As I said earlier, it is hard when kids don't make it but I never stop looking for ways to do it better. I once had a custodian who was robbing us blind. He was a really nice guy – I thought, but his actions cost us dearly, and I had no hesitation in getting rid of him. I know that people criticize the Department of Education, but we are the only organization that takes everyone. We don't pick and choose.

I know that earlier you asked me if I agree with the idea of preparing all students for college. I do have some reservations about this but it is what we have at the moment. It would be good to have more options but our resources are finite and I don't know what we could forfeit if we allocated more resources to vocational education.

A DAY IN THE LIFE OF A DEDICATED TEACHER

I arrived at work very early one morning as I had some things that I needed to do before school started. It was 6:45 am and cold. I walked up the stairs to the 4th floor and to my surprise Mr. Manuel Santiago, a high school bilingual mathematics teacher, was already at work. I said hello and we sat down and enjoyed our morning coffee. I asked him why he was in so early, and he told me that he is at work by 6:30 every day. We talked some more and he told me that he has a one hour trip if he leaves home at 5:30 am but a two hour trip if he leaves home at 6:30 am. He lives way up the Taconic Parkway where it doesn't take much to bring the traffic to a grinding halt. We talked for a little longer and after that I left him to do his work. His trip home can be just as bad so he leaves right on time to beat the worst of the rush hours.

Manuel is Cuban American. He speaks fluent Spanish and very good English. He is a big imposing guy with a heart of gold. It is obvious that his students like and respect him because he always makes the effort with every student. He really cares about his students, and he worries about the ones that get left behind. His content knowledge is strong, and he knows how to use

technology, but he is old enough to remember chalk! His board work is very clear and well laid out. Teachers often have access to a number of electronic tools including Smart Boards, graphing calculators, emulators for those calculators, electronic compasses, software that recognizes language and writes it up as the teacher talks, and programs that can show what each student is doing on his computer, etc. The downside of this technology is that it can falter, and teachers need to be able to fall back on more traditional, low tech tools.

It is interesting to watch students doing basic geometry in middle schools. In my experience, most students do not know how to measure using a ruler. They draw 'straight' lines freehand, and consequently do not know units of measurement. Many do not know how to draw a circle with a compass, again resorting to freehand. When they come to high school the geometry teachers often have to start from scratch. Manuel is aware of these deficits and he works to build these subskills into his lesson.

Manuel tells me that many of his students do not speak English well, and many are also not fully literate in their native tongue. Some are fluent speakers, but not fluent writers. Manuel explains the work in English and Spanish and uses the computer program that writes everything that he says as subtitles on his smartboard. He has found that if he talks to the whole class, only a few are listening, and so he keeps his talking short. Once the students begin work, he circulates the room and addresses their needs in smaller groups. Manuel is a very senior teacher. He is about to retire and has seen numerous changes, most of which have not worked for him. He doesn't understand why teachers are treated with such disdain, but he knows that he only has a short time left. Manuel sometimes has a co teacher in his special needs class. He is patient and fatherly with all students, but particularly this group. He explained to me that once these kids

finish up (they were grade 12 students) that the high level of assistance that they get now will taper off, and they will have to struggle through the next phase of their often-troubled lives.

Manuel is great to work with. He is a colleague in every sense of the word but his time is nearly up. He dreams of the day that he can just work on his property and grow vegetables, and repair his house. He always welcomes me with open arms, in his hospitable Cuban way.

I feel a wave of sadness that he will soon be gone. I reminds me how attrition is not only about the loss of newer younger teachers with all the potential they bring, but also the senior experienced older teachers who are so valuable not only to their students, but to their younger less experienced colleagues who often depend on them for their knowledge and mentorship.

A DAY IN THE LIFE OF A SPECIAL STUDENT [25]

Nona was a grade six girl in a Bronx middle school. She turned up for school every day with clean clothes and shining hair. Her teachers think that she is an angel, but she is just a regular kid. Nona has not missed a day of school and always comes to class on time. She helps her teachers with organizational things when she can, and is always respectful.

One day her teachers noticed that she was not well, and they called her Mom. When the Mom came in, you could see where Nona disposition came from. Mom explained to her teachers that Nona had chronic kidney failure[26] and needed a transplant if she was going to survive. Nona's Mom offered to keep her at home because she was so sick, but Nona insisted on coming to school. Mom explained that one kidney had completely shut down, and the other was barely coping. Through all of her medication, and sickness, Nona continued coming to school. She was losing her sight as well (this was believed to be related to the problems with her kidneys). She began putting on weight due to the type of diet she was required to follow, and gradually became

sicker. She was still coming to school, but now she just puts her head down, and dozes for most of the day. One day she stopped coming, and the teachers contacted Mom. Nona was in hospital.

She needed a transplant urgently. All of her teachers went to visit her, but she was barely conscious, sometimes managing an incipient smile when she recognized members of her school family. The days dragged on, and little hope was held for this little person, who had so much to be unhappy about, but who never complained. Most of her teachers took work into the hospital because Nona was worried about falling behind. Nona's Mom stayed with her for as long as the hospital permitted, but Nona needed a miracle. The wait for a donor organ seemed like forever, but luck was on Nona's side.

Nona had a donor! The phone call came through and everyone waited to hear how the transplant went. She recovered amazingly. She lost the weight that came with the disease, and her youthful color returned. Her eyesight continued to deteriorate, but Nona was a happy little girl. Last year she graduated from middle school after completing her grade 8 studies and she is now happily working her way through high school.

Nona is just one example of the many special education students that pass through New York City public schools. Somehow, this young lady completed her schooling, despite overwhelming odds, and all going well, will finish her secondary schooling in a few years.

A DAY IN THE LIFE OF A MATH CONSULTANT/COACH

I had been trying to set up a meeting with the principal of a new middle school in Brooklyn. The school, which literally just opened last month, is grade 6 only. As usual, my initial contact was by email. This normally is easier for principals because they can reply as soon as they have time. After several email attempts, I then tried the phone. Nobody answered. My last resort was a cold

call. This is a two hour plus drive from my hoe in Tarrytown, and there was no guarantee that she would be there when I arrived.

I was at least able to see the assistant principal and get all of the correct email addresses and phone numbers, but my initial impression was not good. People barely acknowledged me, and nobody knew what was going on. I bit my lip and armed with the correct contact details, I again emailed the principal, and this time got a quick reply and an appointment.

This school was one of many selected by the Department of Education to receive a grant for the Algebra for All program. This is a program that I have worked with since its inception. It helps teachers develop algebraic habits of mind in their students, and offers teachers a chance to get some non-evaluative support in their classroom. They are given a consultant for four days, and are asked to select an area of focus from four choices, these being intervisitation, formative assessment, modeling, and curriculum.

The meeting finally took place one Monday afternoon. The school only had one mathematics teacher, but he was experienced, motivated and smart. The principal was young and excited to have her own school. By the time I was ready to leave, I was also excited and looking forward to my time here. The first day of my work confirmed that this was an amazing school. My earlier disappointment was completely squashed and I could see a rising star in the making.

It is worth noting here that making entry into a new school can be hard. Whether you are a student, or a principal, or a consultant, it can be challenging to cement the relationships and get the job done. There is so much more to working in a new school than just doing your job. Every school is different and a consultant needs to evaluate where they can be most effective.

The job that I do is often impacted by the school's leadership. Principals vary greatly in their approach to running a school and how they use people like me. Sometimes they call me in and

tell me what I will be looking for and what I will be doing. This is my worst fear, because it undermines my ability to achieve what I am here to do. I am here to build a trusting relationship with all people that I work with, and to use that relationship in a collegial way to create an environment that values all participants and encourages instructional initiative. Sometimes the opposite is true. The principals in these schools welcome me and my ideas and often ask me how I can help. It is in schools like these that I feel that I achieve the most. Principals in these schools meet with me regularly, share ideas and ask questions.

Working with each of these people, and with the administrators and teachers that have gone before them, I have learned that there is no one size fits all rule that can be applied. It is important for coaches and consultants to consider the individual needs of the school, the principal, and each teacher, and to build a collegial relationship with each person that we work with. We also need to see how the ontologies and axiologies of each person juxtapose on the leadership and expectations of each institution.

CHAPTER 6: MATCHING DIVERSITY WITH PATHWAYS

My school life could never be held up as a model of success. I was young, inexperienced, and not sure what I wanted to do with my life. I didn't know what I wanted to do 'but it sure wasn't school'. When I look back on those days it is hard to believe that I have somehow made a success of my life. I have meandered through a number of unlikely paths, some of which were dead ends, although all were valuable experiences, and made my choices based on the possibilities I could see. I had a number of role models, but I knew that the only person who could help me was me. I always had a job. These jobs involved long hours for little money and included bank teller, cab driving, night cleaner at a meat works, and pumping gas. At that time in my life I didn't see school as a way forward, just something to get finished so I could leave and get a job.

Interestingly I never saw any of these jobs as anything more than transitional. They were however for many people, their life long occupations. I think that they were valuable experiences as they gave me an understanding of what it's like to work long and hard and make just enough money to get by.

While I had never really aspired to being a tradesman when I was younger, I often regret that I didn't get a trade qualification. All of the men in my family (my Dad and my 3 brothers) were all great with their hands. My Dad could build anything; my younger brother was disabled but nevertheless was highly skilled with electronics (self-taught). My two older brothers were also self-taught and made careers for themselves building boats and in computing.

This idea of learning on the job was then commonplace, and people learned by doing and working with others who shared their knowledge. It was a kind of informal community of practice (Lave & Wenger, 1991). High schools nearly all had vocational training components

and this gave many people a grounding in manual arts. Apprenticeships were available but there were not enough to satisfy the demand. My brother Scott who builds boats started off by working with a man who lived down the street when we were kids in Queensland. Scott learned to repair steering and throttle cables for boats. Within a few years the old man decided to retire and Scott took over the business. Over the years his knowledge and business interests expanded. Today he runs a multi-million dollar business that builds boats for the public and for various government agencies. The business employs about 50 people.

When I look at many students in schools today in New York City, I see kids who like me didn't immediately aspire to higher education, and didn't have available pathways into a trade or other skilled area.

I wrote Chapter 6 as a direct result of my own unconventional pathway through education. I never had a clear vision of where I was going, but instead moved forward as each new goal presented itself. My experiences with amazing people who could build, repair, improvise, and design had a big impact on my own educational pathway. The story of Ashley, the young girl who blazed an amazing trail across nations in her quest to become a cheesemaker, (Bleier, 2018), was, like my own story, far from linear.

In this chapter I examine a number of people who have chosen a pathway that is unconventional, and yet rich, exciting, and challenging. The chapter is included, not because it helps us understand the role of mathematics teachers in an urban school, but because it selects individuals who have chosen pathways that are meaningful and fulfilling to them. When I sit in a classroom and see students who are not buying in to a lesson that is meaningless and unconnected to their world – I wonder how such students are going to continue on this path

through a college program that will see perhaps 6 or 7 years of struggle leading to a qualification that involves little passion or meaning,

Samuel Love advocated the introduction of vocational training into the public schools in 1871, and in 1874 he successfully introduced manual arts into the public schools of Jamestown NY. This was the first place in the United States to introduce manual arts training into a public school. (Krempa, 1996)

Love was a teacher in the public schools of Buffalo, and in 1865 came to Jamestown. He pioneered the teaching of physical education, manual training and commercial education. He believed in education of the hands and the mind and championed physical, manual and vocation education. Love's vocational courses were so well received, that he wrote a book entitled Industrial Education – which was eventually distributed to other schools throughout the state.

John Dewey's support of this activity in the early 20th Century contributed towards the push for inclusion of industrial arts into the general education program. New York City passed the Trades School Act of 1908 helping to the answer to the question, "Shall we have public trades schools?" Prior to this there were only four vocational high schools in New York, three of which were in New York City (Parkhill, 1938, p.1). The website of the Teachers College of Columbia University (2018) explains how philanthropist Grace Dodge began what is now the Teachers College with vocational offerings.

> It all began humbly enough. In 1880, Dodge created a "kitchen garden" school in Greenwich Village to teach cooking, sewing, hygiene, and other practical arts to poor, immigrant women. As the effort took shape, she realized that a new kind of pedagogy was in order—teaching that reflected an understanding of learners' backgrounds and of how to present material in relevant, meaningful ways.

Manual training in schools continued to grow throughout the first half of the 1900s movement. It was not until the 60s that vocational education came under closer scrutiny as the space age came upon us. (Krempa, 1996). As recently as January 2008, New York City mayor Michael Bloomberg addressed the deficit worldview that vocational education is a second rate option that was seen as a dumping ground for failures and minorities. He was quoted by the New York Times as saying…

> Traditionally, such career and technical education has been seen as an educational dead end. We're going to change that. College isn't for everyone, but education is. (Cardwell, 2018)

I arrived in 2003 in the wake of the closing of most of the vocational schools in New York City. I have struggled with the idea that all students should go to college and see this as a limiting option for students trying to find their way to a career. It reminds me of a sterilization process where the system has been disinfected and all undesirable pathways killed off. No longer are students developing skills that involve the hands. The important work that vocational pioneers such as Grace Dodge had begun, had fallen by the wayside, and pathways to many important careers seemed to be no longer valued by the most important of all public institutions – the public school system.

The vignettes that follow relate some personal experiences that I have had with some amazing people who repair, fix, install, and improvise. These people are sometimes formally trained, and sometime they are self-taught. They are people for whom learning never ends as they continually upgrade their skills to keep pace with technology. I hope that you enjoy the experience of reading about them as much as I enjoyed interacting with them and watching them keep the world running.

STORIES FROM THE FIELD

SAM – FROM SUBMARINES TO SUBARUS

A few years ago, I went to see Sam, my mechanic. He works by himself in a small workshop just outside New York City. He is a recent immigrant who speaks Russian fluently and English not so fluently. My father-in-law recommended him to me after my aging car needed surgery. He was perfect for the job. My car was an old Volvo. In his broken English he explained to me that I was crazy for having an old Volvo, and that parts were as expensive for an old Volvo as they were for a new one. I asked him to do the best that he could, and left it with him. Sam used to be a submariner in the Russian Navy. It was his job to fix anything that broke. Now, when something breaks on a Russian submarine, there are rarely spare parts available, and Sam learned to improvise. People depended on him for their lives and he always came up with the goods. Sometimes his work involved welding broken parts outside the craft. This could involve welding and working underwater under very challenging conditions.

As a mechanic in America, Sam has formed a close bond with other Russians who have also started mechanical workshops in New York. He is the leader of a small Russian community of practice that comes together periodically to provide mutual support, and share ideas and equipment. Sam is a hardworking and creative tradesman who is trying to establish himself in the USA. His home is nearly one hundred miles from his workshop thus guaranteeing at least four hours commuting each day. Sam bought his house in very run down condition for a low price, and rebuilt it from the ground up.

Sam regularly has to improvise when parts for older cars are unavailable or too expensive. I know that my Volvo is probably full of parts from discarded washing machines. When I came back to pick up my car, I was expecting it to be expensive, but thanks to Sam's ingenuity it was

not. Sam, as my father-in-law explained to me, was a thinking mechanic who was often able to repair what others would simply replace. Once again Sam had worked his magic. The Volvo now ran like a dream! This reinforced my earlier comments that to be a good tradesman, you have to be smart, persistent, and creative. Good tradespeople are not rejects from other callings. Sam's final words, "Buy a Toyota next time!"

WHAT A GAS!

We recently made the momentous decision to convert our house from oil heat to natural gas. Not only is this conversion very expensive, but it meant dealing with at least four different companies, coordinating them and ourselves for the numerous times the various teams would be coming into our basement. It involved also working with Con Edison, and being at their mercy.

Dealing with any monopoly can be challenging, whether it be a public entity or private, but this was an experience for the books. Our main contractor was a plumber, or should I say a team of plumbers. We also had electricians and numerous others traipsing through our house. Finally, after months of juggling, we had the final inspection.

Our plumbers were a great team of tradesmen. They would frequently turn up for an inspection, only to find out that Con Edison had postponed it and hadn't told anyone. Our dog Lucy, who is not friendly towards strangers, had turned into a beast so we were forced to send her off to doggy day care any time there was work happening.

The scope of the work surprised me. The plumbers and electricians were dealing with state-of-the-art hardware and electronics. There were inspections on a regular basis that were often drafted in the dark ages. Sometimes these inspections involved plumbers making major changes to their work. The various tradespeople answered all of my questions clearly and knowledgeably. With patience and perseverance, they launched themselves into the mass of pipes and wires,

gradually removing the existing parts for the oil heat, and installing the new natural gas equipment. The thing about a tradesman's job is that no two jobs are the same. The team of individuals with different expertise and different experience were able to work toward a single goal. Their combined expertise helped solve emergent problems with the job. They also managed to help me understand what they were up to. I have always admired the work that trades people do, but to see these guys working through the multiple layers of technology and bureaucracy was something else.

WHAT MAKES A GOOD TRADESMAN?

A truly good tradesman combines experience with the regular updating of knowledge and skills. Yet we clearly draw that line between higher education and vocational/job training. How can we get to a place where we are not labeling these things to exclude/include people and recognize that we all learn (i.e., generate knowledge of) different things in different ways? All of us engage in making sense of the world via a bricolage of training, experience, etc. Instead of treating vocational education as an option for people of lower ability, shouldn't we think about it as an alternative and desirable option for all? I wonder if a student who is directed into a college program that he/she doesn't want to do, and finally completes it after six or seven years, is preparing for a career in that field? Flexibility and multiple possible pathways in an emergent trajectory would provide more opportunity to all including those who just don't fit into the current academic landscape.

When I talk to people who have these amazing skills, I am often surprised by the challenges that they had to overcome to do the work that that are doing. Very rarely did schools provide a supportive pathway to get where they were going, but instead students encountered a series of barriers that took determination and perseverance to overcome. It is my hope that these short

stories will help people understand that learning should be a process that accommodates a wide range of people and that values everyone's career path as equally important.

CHAPTER 7 IMPACT OF THE RESEARCH – WHAT'S NEXT?

George and Marissa (the two main participants in the research) are two decent hardworking people. They do not make up an n of 2. They are not representative of a population to which I will be applying my findings to make predictions about a larger population. Marissa was selected because she was enthusiastic about my research, and George was selected at a later time because he was different to her in so many ways. Marissa is female, young, black, and enthusiastic. She teaches mathematics in a middle school in Queens NY. She is from Dominica. She has only been teaching for about five years. George is male, white, close to retirement, and frustrated.

While Marissa and George have many differences, they also have a number of things in common. They are both union representatives for their colleagues, and they were both dedicated practitioners. They both struggled through the multiple barriers that are embedded in the system. These two teachers are not unlike vast numbers of teachers trying to make their way despite challenges with students, colleagues, and administrators. It is because of their differences that we are able to learn from each of them, and when we take these differences together, they provide us with a richer, more complex understanding of the situation. Sometimes the differences are subtle, an inflection, a hint, or a smile, but such nuanced communication can make a world of difference. The interpretation of such difference is also dependent on our own understanding and experience.

George was picked using the selection criteria serial and contingent. He is older – near retirement age, male, white (of Greek ancestry), and not as socially adept as Marissa. He taught mathematics in a large high school in Brooklyn. These teachers could not be called typical. In fact no teacher is typical. Each teacher brings their own experiences, knowledge, and style to the classroom, despite their differences; at no time did I see either teacher do less than their best.

The one thing that was different was the impact of crypto positivism on their lives. George grew up in the 'old school'. Teachers were generally respected and they were allowed to do their jobs. Modern evaluation is far less accommodating. Marissa is young and hasn't seen the changes that George has. So far Marissa is coping well with the struggles that a monologic system imposes on her. On the other hand, George has been worn down by years of fighting to do his job in a way that works for him. The system beat George.

George was never ambitious in terms of title and position. He was happy to stay as a classroom teacher even though he could easily have become a principal or higher in the time that he had. Marissa is very ambitious, and she will be an agent of change. She already is having an impact through her exemplary work, and civic mindedness. Marissa is looking ahead to a bright future where hopefully she can bring at least some positive change to an organization that is trying to cope with so much, while suffering the same bureaucratic problems that large and cumbersome organizations have in abundance.

THE WINDS OF CHANGE

In many ways, this research along with my studies at the Graduate Center has changed my own beliefs and approaches to working in as a coach / consultant in New York City schools. I began to learn about cogenerative dialogues, radical listening, the Belmont Report, the Authenticity Criteria, the idea of hermeneutic phenomenology, and the negative effects of positivism. It occurred to me that for years, I hadn't learned how to value the rich and diverse conversations that were all around me. I always worked hard to keep up to date with the work I was doing, but then, in the professional development phase of sharing, it was a one way street. In my early years as a consultant /coach, I couldn't understand why some people weren't on board with the things I was saying.

As a result of my studies I changed to a model that better appreciated the value that every participant brought to the room. This was a model that appreciated and welcomed diversity where everyone was treated with respect. I adjusted my axiology and ontology to embrace the importance of radical listening and cogenerative dialogues, and adjusting my standpoint based on the ideas of all participants. My own take on cogens has been that it is not necessarily a goal to have synchrony, but more a tool to understand all participants and to respect each participant's standpoint.

When I first started writing this dissertation, I had a sense that I would be looking at aspects of mathematics teaching. The nature of emergent research is something that sometimes takes you down a different path. The discussion moved towards the problems related to teacher retention, attrition, and evaluation, and later towards an examination of pathways including vocational education and the very narrow field of possible ways to complete school education. The complex interrelationships between students, teachers, and principals, were further examined and we could see how different the view from each of these perspectives was.

Early Days in New York City

The New York City Department of Education has come a long way since the colonial days of New Amsterdam and the Public-School Society. Andy McCarthy (2014), in his blog for the New York Public Library, talked about the days when schools were guided by the tenets of the Dutch Reformed Church and the complex and antagonistic ideologies of public and private institutions reflected the influence of politics and religion. In the early colonial days there were just a handful of teachers who taught in the New Amsterdam schools, and segregation was the norm.

Now, in 2018, we have over 1.1 million students and more than 75,000 teachers in the largest educational system in the country (NYCDOE, 2018) How far have we come?

I recall a small school in Queens, NY. It was a regular public school in a large multi school campus. It was not a selective school but I remember being enormously impressed by the quality of teaching, and the professionalism that all members of this community displayed. One day I had a chance to sit down with the mathematics assistant principal and I asked him what was going on? Why was this math department functioning so well? What was the secret to this school's success? He said that when the school recruits teachers, it takes it very seriously. But it was more than this.

Having worked in literally hundreds of city schools, I am still in awe of this school's achievements. It made me think of the enormous loss any one of these teachers would be to the students and to the school. Teachers are supported and respected, and treated as colleagues. Their ideas are welcomed.

Revisiting Teacher Attrition

The data for New York City shows an average attrition rate of between 21% and 25% for new teachers in the first two years of teaching (NYCDOE, 2018), yet this school had less than 10% loss of new teachers over the same time period. The resulting stability, and impact on student behavior, attendance, and performance, was more than coincidence.

I raise this point because there is no other profession that loses people at anything like the rate that the teaching profession loses teachers. It is not just new teachers that we lose. Jeremy Glazer (2018) talks about *exit as resistance*, where invested teachers are not leaving due to lack of commitment to the job, but from a loyalty to a set of beliefs. Doris Santoro (2011) felt that

these teachers were unwilling to work in ways that were incompatible with their core beliefs about good teaching.

Why are teachers who have made a significant commitment to teaching, leaving the profession? Carolyn Carlson (2012) addresses the issue of principal leadership. She says that although issues such as a sense of success and job satisfaction are important, the most significant issue is the impact of principal leadership. Carlson concludes by saying that effective principals create an environment where teachers feel a sense of collaboration and support.

Nicole Simon and Susan Johnson (2013), present an additional idea. Even though there is research to suggest that teachers migrate from schools with high levels of poverty and high numbers of minority students to schools with students from higher income families and non-minority demographics, that they are not fleeing the students, but are leaving because of poor working conditions. Simon and Johnson further state that the working conditions that teachers value most are social in nature. These include school leadership, collegial relationships, and school culture.

Let's now consider the costs of this huge attrition rate. Just imagine for a moment, a class of say 25 students that loses its mathematics teacher. What do the students feel? Did the teacher not like them? Would their teacher rather work with different kids? What's our new teacher going to be like? Imagine that the outgoing teacher had built relationships and had successes. How long before the replacement is successful if at all? Will the students have a substitute teacher and for how long? The impact on this group of kids is hard to measure. This is just one teacher. Now multiply this by 450,000 – the number of people in the US leaving teaching every year, and you will have a sense of how serious the problem is.

These are grave issues. Across the country, there has been a huge focus on the recruitment of new teachers using a number of pathways to fill the available positions. Many of these pathways are merely a compressed teacher education program with on the job professional development. The graduates of these programs are then often placed into classrooms that are the most in need of an experienced teacher. Recruitment shortfall is not the only reason that we are short of qualified teachers. Richard Ingersoll (2004) says that a teacher revolving door is a significant factor in the shortfall. He says that the data show that much of the turnover is accounted for by teacher job dissatisfaction and teachers pursuing other jobs. Richard Ingersoll and Henry May, (2011, p.17), explain that efforts to solve these staffing problems have focused primarily on recruiting promising teachers into high poverty schools, often with little attention to systematically supporting and retaining them once they are there.

The data also indicate that low salaries are not the only reason for the high level of turnover in disadvantaged schools. Significant numbers of those who leave their jobs in these schools report that they are hampered by inadequate support from the school administration, too many intrusions on classroom teaching time, student discipline problems and limited faculty input into school decision making.

What do teachers want in their workplace? Nicole Simon (2013) says that the things teachers want are mostly social in nature and include good school leadership, collegial relationships, and a positive school culture.

Teachers often ask me if teachers do a better job in Australia. Although we have considerable cultural diversity in Australia, it is not to the extent that we have in the USA. The challenges faced by New York City teachers working with the most diverse student population in the World,

include poverty, emigration, language, cultural diversity, religious diversity, children with adverse childhood experiences, and many others.

It is clearly easy to criticize an established practice while failing to offer any alternatives. I conclude this chapter by offering an alternative paradigm for teacher evaluation and retention that incorporates many of the methods that we have advocated. I begin by examining aspects of the current model and then presenting an argument for change. I then suggest an alternative model that addresses the important issues raised by teachers.

Teacher Evaluation, an Asset or a Liability?

A few years back, New York City schools adopted a series of rubrics written by Charlotte Danielson (2013). These rubrics were originally designed for professional learning and were later adapted for use as an evaluation rubric. These standards were used in official teacher evaluations that directly affected employment and tenure decisions.

Stephanie Reinhorn and Susan Moore Johnson (2015) talked to principals and teachers about evaluation. Teachers were surprisingly willing to be evaluated, but had an expectation that the evaluator would use the evaluation to give timely and actionable feedback, and not just lip service to the process. Principals implemented and used evaluation differently at different schools. In some cases, it was to evaluate and improve, in one case it was to evaluate and weed out teachers they perceived as ineffective and whom they were unable or unwilling to help, in other cases it was just done for compliance.

The model that is being suggested here is one that values teachers as professionals and as colleagues. In this model, teachers are respected for their knowledge and professional judgement. Evaluations are not done for compliance, but as a way of understanding the teachers work.

Teachers are not assessed using a rubric written by one person, but using a combination of factors based on classroom visits and dialogue between the teacher and the principal[27].

The model proposed by Frederick Taylor and supported by John Bobbit at the turn of the 20th Century (Bobbit, 2013) and adopted by school districts across the country became so entrenched that it still be seen in schools today, and manifests itself as crypto positivist management practice in schools.

LOOKING BACK AND LOOKING FORWARD

Monologue is the prevalent approach to communication. Monologue is a one-way, self-fulfilling prophecy that shuts out the important other voices in a community of practice. Dialogue on the other hand introduces the important element of polyphonia – multiple voices such that the final product is representative of those with a stake in the practice. Too often we are under the umbrella of a hegemonic decision-making process. We have to accept this and work with it otherwise we will lose our job, or be discredited and reduced to an insignificant player in the community.

The thing that surprises me about this research was my emotions as I wrote. Initially writing about my own experiences brought back memories that were sometimes good memories and sometimes not so good. I began to remember things that were long forgotten / suppressed from deep in my subconscious.

Probably the most emotional piece for me was writing about Nona. She was a sweet little girl with almost insurmountable health problems including kidney failure and consequent progressive blindness. She also has learning difficulties, but she never complained about her situation. I also found that as I wrote, the memories became rich again.

Similarly, the story about George, which unfolded as I wrote, was both interesting and sad. Often we tend to just see things from our own perspective, but George's story gave us a snapshot of another life, and how the crypto positivism that is so embedded in our institutions, is able to destroy lives, and how an individual who has dedicated his life to the teaching profession, suddenly finds himself alone and discarded because of the top down management style that still prevails in many schools.

I also met with Mary, the principal who fired him, and she told her story. While I certainly did not agree with what she did to George, for the first time I was able to see through her eyes, the complex, and often unwinnable situations that arise when you are running such a big and challenging organization. She explained how even as a principal she often has to do things that she disagrees with.

It is strange how much we pride ourselves in the New York City school system, both on our diversity and the way we accommodate it, however, I find myself seeing a great deal of evidence to the contrary. We have students who are required to be at the same level at a given age, despite sometimes coming to us after years of neglect. My colleague, Mitch Bleier was passionate about this issue. He explained that the single pathway model does not address variations in students' personal schooling experiences, and it also ignores the natural variability that makes each of us an individual that develops in different ways and at different rates. We have but a single goal for our students – to go to college. This is despite claims by the previous Mayor of NYC Michael Bloomberg who said that he placed a high value on vocational education and yet we continue to move down a single pathway – college for all. While this is an admirable goal, it is just that – a goal. There are many appropriate pathways that students could follow, and many rates that they could progress through these paths. When people are made to feel worthless because they didn't

go to college, even though we may have had a passion for building, creating, designing, repairing, or service, the harm can be immeasurable.

Andrew Robinson (2011), in an article on dialogism, discusses Mikkail Bakhtin's ideas that refute the prevalent positivist mindsets that are embedded into our institutions. He says that authentic human life is an open-ended dialogue, and that people constantly struggle against external definitions of their thoughts and actions.

Despite the inadequacies of our institutions, the public schools of New York City reach out to every student, and make them welcome. Despite all of the handicaps that the system embeds, we have an army of mostly enthusiastic people who are passionate and hardworking.

Are all of the students that we have going to end up in college? Is the work that we are doing in schools preparing students for their chosen professions? It seems that until we can better celebrate individual differences, and embrace these through an inclusive dialogue we will be severely limiting the hard-working professionals that our teachers are.

Now a closing thought. Imagine for a moment where we would be today if Taylorism (Ireh, 2016), had not been one of the dominant educational models at the turn of the 20th Century, and that John Dewey had prevailed. Where would we be now? I think that I would be writing a very different dissertation.

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CONNECTING TO PRACTICE IN SCHOOLS

In 1902, James Matthew Barrie wrote a comic stage play called The Admirable Crichton. This was adapted for film in 1918. It was further adapted in 1957 in the film starring Kenneth More and Diane Cilento. Set in 1905 in class conscious English Society (Wikipedia, 2018), butler

William Crichton works for the Earl of Loam and his family. When the group becomes shipwrecked, Crichton becomes the leader. The aristocrats prove to be helpless in their strange new surroundings. It is up to Crichton to start a fire, provide shelter, and find food. After several years the social order has been completely reversed: Crichton is in charge, while his former masters are his servants.

Suddenly Crichton's skills and knowledge are valued, and his status is raised. The artificial constraints applied by a society that places a high value on a person's class are suddenly worthless when these societal norms were reversed. The skills that Crichton had were valued once the constraints of class were negated.

Joe Kincheloe (2000, p.6), in his book Toil and Trouble looks at what has happened through a Cartesian lens, when he says;

> The modernist mindset that separates the humanistic and the economic realms embraces a profit maximizing framework which excludes social values from the conversation about work… and the industrial transformation of Western societies from the integrity of craftsmanship to factory work…

The transformation from being craftsmen to factory workers devalued the breadth and depth of skills that these former artisans and tradesmen had. The downgrading of what we loosely call manual labor, has colored our thinking to this day. Gone are the craftsmen who were revered by all of society. Gone is any thought by those who make the decisions in education, that there are people who desire such professions.

You might ask what all of this has to do with teaching mathematics in urban schools. The thing that struck me when I first arrived in America in July 2003 was the push to get kids through school and into college no matter what. It didn't matter if the students were unready or unwilling to follow the single pathway from kindergarten through to college; this was what they

all had to do. It seemed that anything involving manual labor was deemed unworthy as a career goal.

It made me wonder why there is but one track embedded in our minds when it comes to education. We go through the layers of school; elementary, middle school, and high school. We are then expected to apply for college. This seems to be the current worldview in the USA and in many other countries. If you disagree with this (which I do) then you become some sort of pariah.

Having worked in city schools every school day for the last 15 years, I can tell you that a significant proportion of our students do not fit the standard model. Making kids sit in classrooms day after day with the distant hope of graduating high school. What then? Let's prep everyone for college and give them remedial courses that have success rates of about 10%. Let them struggle for two, three, or four years and then, take the barely acceptable GPA's to an employer. GPAs are often held up as an indicator of future success. Of course, we know that a high GPA is not necessarily an indicator of preparedness for work. Much of the work that students do in school, does not involve independent learning or initiative of the sort that is often demanded in the complex and challenging contemporary work environments.

In New York City we also have transfer schools. These schools are kind of second chance high schools for older students (16-21 years old) who didn't make it through the first time. Many of these kids have jobs and other commitments. Attendance at transfer schools is poor – usually around 65%. The good thing is that every student who graduates from transfer schools is a win, both for the student and the system. There are many other programs that are designed to assist students get into college. CUNY has a bunch of these programs and many have proven highly successful. CUNY START, ASAP, LINCT, and many other great programs in the CUNY

Research Foundations' office of K-16 initiates, have, and continue to be, helpful in getting students better prepared for college. While the rhetoric of the last few years has centered around encouraging every young person in America to go to college as a way to find gainful employment and a guaranteed route to the middle class, some are increasing their calls for multiple pathways to those outcomes.

As good as these programs are, they are all based on the assumption that everyone should go to college. There is in fact, plenty of research that shows that in the long run, a good broad education will leave people better equipped to cope with a changing workplace over time. The article in the Brookings Institutions' Brown Center Chalkboard by Eric Hanushek and Ludger Woessmann (2017), suggests that in a knowledge-based economy, early employment gains with vocational training may lead to later problems when specific skills become obsolete and workers lack the ability to adjust to a changed economic environment. Is this enough evidence to completely discount the fact that many students will be deeply unhappy with a pathway that involves college? Mitch Bleier (2018), felt that these vocational settings should also be designed in a way that respects, acknowledges, celebrates, and supports the idea that work with the hands is an intellectual endeavor. That the carpenter, electrician, gardener, chef, photographer etc. all do work that is skilled and valuable and that practitioners of such work have not settled for what they do but rather aspired to it. What is to stop students who take a vocational education path from going to college later? As technology changes the workplace, people could regularly update their skills and knowledge to remain competitive as well as learning on the job in a changing workplace. In the meantime, they could have secure well paid work. It is an interesting argument to say that kids shouldn't follow a certain pathway because things might change.

Even though some research shows that people who received a broad, general education earned more over their lifetimes than otherwise similar people (that is, with similar test scores and years of schooling) who had attended vocational programs, it doesn't account for people who were unsuccessful in college, or didn't go to college.

Matthew Crawford's 2009 article in the NY Times, *The Case for Working with your Hands* (based on his book *Shopclass as Soulcraft*.) is by and about an academic who became a motorcycle mechanic and left the mind numbing white collar/academic world for what he describes as the true creative and intellectual work of building and repairing motorcycles.

This research however failed to accommodate those people who had been railroaded into academia, and had been unsuccessful. They had not been given the chance to follow a pathway that more suited their wishes, and would more than likely lead to a productive career. There is a large population of students who will be deeply unhappy with the standard pathway. The idea of Vocational High Schools pairing up with industry, and graduating students with a trade qualification may be just one of many possible pathways that would better enable our increasingly diverse student population.

The National Research Center for Career and Technical Education at the University of Louisville explains how European models in countries such as Finland[28] and Germany[29] that have pathways where children of middle school age take tests and either move on to apprenticeships or a university preparation route do not come with the stigma that is prevalent in America. They further note that…

> …these countries have some of lowest youth unemployment rates in the industrialized world, and going through an apprenticeship in no way prevents one from moving on to college… and while the rhetoric of the last few years has centered around encouraging every young person in America to go to college as a

> way to find gainful employment and a guaranteed route to the middle class, some are increasing their calls for multiple pathways to those outcomes.

It seems that as technology infuses itself into every facet of our lives, that the line between blue collar workers and white-collar workers is not so clearly defined. The plumbers who did my natural gas conversion are a far cry from plumbers of old. Not that they are better, but they need a different skill set that often crosses boundaries not previously required. They had to deal with very sophisticated technology which involved reading and interpreting complex instructions, whilst taking into account rules and regulations which are very stringent for gas installations.

Automotive mechanics such as Sam have to understand how to use and interpret analytical data from computers linked to modern vehicles. Tradespeople today have to be computer literate and they have to keep pace with the technology that reflects the demand for greater efficiency and environmentally friendly products and appliances. They need ingenuity to match these new technologies to older infrastructure and make it work. Of course this is a complex debate that will not be effective until we see vocational education as a desirable and equally important pathway into a profession. It is important to note that there are tech companies such as Google and Yahoo that do training in house, while paying their employees very well. There are many tech companies now that are not even requiring an undergraduate degree, preferring to do their own training.

IN FAVOR OF DIVERSITY

Mikhail Bakhtin was a discourse theorist working unhappily in Stalinist Russia. Bakhtin was also a proponent of polyphonia. He contrasts a World made up of a single dominant perspective with the concept of dialogism where we recognize the multiplicity of perspectives and voices, where human consciousness is not a unified entity, but is always conflict ridden. Bakhtin also takes the

idea of radical listening a step further when he said that it is not enough to simply understand the other's perspective, but one should see that perspective from outside to produce something new or enriching (Robinson, 2011). Bakhtin also noted that any view is going to shine light on some aspects of an idea and obscure others. Bakhtin used the carnivalesque metaphor to show a performance with no boundary between performers and audience. Here diverse voices are heard and interact.

The current school model of one size fits all, represents what Bakhtin called monologism, where a single idea is represented. He talks about the false unity of the dominant system and its replacement with a lived unity in contingency. (Robinson, 2011, no page number available). This idea of a false unity really makes a connection to what is happening in the NYCDOE. We have the hegemonic decision maker(s) deciding for us that every student must go to college, and schools are directed to push this idea, despite the fact that there are many, many great models out there that celebrate diversity. Perhaps we could also consider the idea of examining both sides and understanding them well enough to design a "third way" as described by Bourdieu (1977) where he said that evaluation of these different positions led him to consider the theoretical value of both.

A FINAL WORD

As the author of this dissertation I began by struggling with the selection of a dissertation topic. 'Just start writing' I was told on numerous occasions. Despite years of experience in hundreds of schools throughout all five boroughs in New York City, I was initially unable to make a choice. It wasn't that I was short of possible things to write about, it was probably more a case of having too many ideas. After a number of false starts I began writing about my experiences and the

words began to flow. As I wrote, the memories came rushing back and each new paragraph lead to another.

Understanding what it is like to be a mathematics teacher in an urban school begins with a watching, listening, and talking about what is going on. Little by little I found myself wondering why things are as they are. I had so many questions over the years but gradually realized that I was becoming acculturated into a school culture that was initially so different to mine.

This research is a combination of my experiences, the experiences of other participants such as teachers, students, and administrators. It is also mediated by an understanding of historical aspects and even to a degree by biological aspects of the research. Of course to properly understand the historical aspects of present day practice it is important to appreciate…

> …that our knowledge of the educational past is always partial—dependent upon what happens next—critical historians promoting an affirmative presentism understand the hermeneutic limits on any historical research. We all live and operate in a particular social, cultural, political economic, discursive present and it is that spatial and temporal locale that creates the horizon on which we view the past. The better we understand our present situation, the more rigorous our historical scholarship will be (Kincheloe, J. Villaverde, L. & Helvar, F. 2006. p.25).

While I do not want to be infusing presentism into my interpretation of contemporary practice, there were events that took place at the turn of the 20th Century that may have impacted practice in schools to this day. These include Taylorism (Ireh, 2016) named after the Frederick Taylor who was an industrial efficiency expert. There was John Bobbit (1913), a supporter of Taylorism, who when debating curriculum said that teachers were not capable of determining such methods. Finally, the widespread use of an instructional model based on the work of German philosopher Johan Herbart known as the Five Formal Steps of Teaching and Learning

was implemented in response to the fact that many teachers at that time did not have a tertiary level education and needed a guiding hand to do the work.

I know that when I considered these historical factors that they seemed to explain some of what happens in schools. It explains the one size fits all mentality, and it also might explain why teachers are assessed and sometimes treated like they are incapable of making good choices.

When I look at the world of teaching in an urban school, the challenges are great and many. I think that it is clear that a large system such as we see in New York City needs standardized components, but I also see lost opportunity when we fail to accommodate diversity. I see teachers who are lost to the system because they do not conform, and I see students, condemned to a college bound pathway, struggling to gain access to a college program that does not fit their needs, and having no clear pathway – vocational or otherwise.

Success in many cases boils down to individual teachers who learn about their kids and work with them to develop growth and proficiency. I think that people who read this work will see an urban system that is trying to be fair and equitable. It will also see a system that is squandering opportunity and wasting valuable resources. It will see a system that does not always value teachers as colleagues and professionals.

I have learned to listen, and have learned to make a conscious decision every time that I am part of a conversation or dialogue, to really try and understand what someone is saying and where they are coming from and to try an put myself in their shoes. I have learned that there is rarely one correct answer, and that the answer depends on where we are coming from, and where we are going. Sometimes there won't be an answer, just more questions.

I have learned that generalizability comes in many colors and that statistical generalizability is a goal that is incompatible with authentic inquiry. My research is about understanding people –

not numbers. All my life I have been subject to information based on statistics, conformity, and broad statistical generalization. My research is about celebrating and understanding difference, selecting people to participate in my research because they are different – square pegs in round holes. We intentionally have a small number of participants because we want to understand each one and understand their ontologies and axiologies. Such understanding is impossible with large numbers of conforming 'subjects'.

I think that my own understanding of important methods such as cogen has shifted over time following my participation in many cogens over the years. My initial understanding of cogen was that two or more people would engage in a dialogue until they reached a consensus. I now believe that cogen is a way to better understand each participant's standpoint and to give people the opportunity to explain and share their ideas and so in the sense of the authenticity criteria, such practice is educative to all participants in that we are walking away with perhaps some shifts in our own ontologies, but also with a better understanding of where each participant is coming from (Guba & Lincoln, 1989).

There will probably be some beneficial ripple effects from this work. I think mainly because of the ways that I have changed that my practice will also change for the better. I have learned a lot from my professors and my colleagues and it is my hope that some of this will have an impact on the many people that I work with each day.

I have always understood that nonconformity and subjectivity are bad things. I hope that people who read my dissertation will see that qualities such as non-conformity and subjectivity are often assets that help us build understanding and appreciation of difference and diversity, and instead of seeing people as 'outliers' that it is these very people who often make the greatest contributions to society.

ANNOTATED BIBLIOGRAPHY

[1] The broad definition of free appropriate public education (FAPE) pertains to the least restrictive environment (LRE) for the provision of special education services as legislated though the Individuals with Disabilities Education Act (IDEA). (Teal, C. 2013)

[2] A Rich Problem of Practice focuses on the instructional core, is directly observable, is actionable (is within the teacher's control and can be improved in real time), connects to a broader strategy of improvement, is high-leverage (if acted on, it would make a significant difference for student learning), identifies a student learning need and a teacher professional practice struggle. (Reinhorn, 2018)

[3] John Dewey, (1859 – 1952) was a leader of the progressive movement in education in the United States. He saw learning by doing and development of practical life skills as crucial to children's education. Dewey believed that education should be a democratic process as opposed to the total control espoused by the scientific management model proponents.

[4] These standards were developed in response to the USA's poor standing particularly in mathematics education. They were called Common Core because a significant majority of the standards were common to all participating states. The states were able to individualize about 15% of the standards but most adopted 100% of the standards. While the intention behind these standards was good, the implementation was severely flawed causing many teachers to revert back to old instructional methods. This was often part of the reason so many students were not achieving at the desired level. While schools put considerable resources into training, it can still be hard to see widespread evidence of this work in the classroom.

A major struggle for students has been the increased complexity of written response questions. Students who were already struggling with the language in the old standards, were even more challenged by the Common Core.

If instead of merely introducing the Common Core State Standards, NY adopted them pretty much as they were. Despite the best intentions these standards were not responsive to local needs, but national, one-size-fits-all standards that were imposed from the top down. Also they only addressed Mathematics and ELA, but were imposed on teachers and learners of science, history and other subjects.

[5] The New York City website on February 9th 2018 included an announcement by the Mayor, Bill De Blasio that the four-year high school graduation rate in New York City is the highest on record. The site also advised that the graduation rate for all students who entered 9th grade in the fall of 2013 rose to 74%, (a 1.2% increase). The dropout rate fell to 8%, (a 0.6% decrease). Graduation rates improved across all ethnicities.

[6] Cogenerative dialogue is used regularly throughout this research. It is both a method and a methodology. That is, cogen can just be a tool that is used to understand differences by bringing people together and engaging in dialogue. It can be a way of putting things on the table. It is a methodology in that it highlights individual axiologies and ontologies that often exist inside a positivist worldview. Therefore by using cogen as a methodology allows important ideas to surface in context despite the hegemony that exists in the system. The critical role of cogen (as it is often called) is to bring people who are sometimes far apart, to the table and to engage in a dialogue incorporating tools such as radical listening, to equalize power and other differentials. Cogen can also be used as a way of getting to better understand others' points of view and to adjust our own ontologies. My use of cogenerative dialogue was

influenced by the work of Roth and Tobin (2004), and many others including Chris Emden (2007), Gillian Bayne and Kate Scantlebury (2013). Ken Tobin, in the Roth and Tobin article said that

We decided that the two students could bring the cogenerative dialogue to the whole class, using a computer and projector to present video vignettes that showed the contradictions and then to allow whole class discussion that would allow all participants to consider what the small group had considered and decided. The whole class dialogues then became a place for collective decisions to emerge within a context in which respectful interactions could occur, with the understanding that no voice would be privileged and it was safe to make critical statements about others as long as the interactions were respectful and free of malicious intent.

[7] The idea that all research must be generalizable is not compatible with authentic inquiry. Authentic inquiry usually includes research involving participants who are selected not because they are the same, or they conform to predetermined criteria, but because they are unique and different. We are interested in learning about each person and to better understand their ontologies and axiologies. Such research is not independent of the observer or context. Sociocultural research also allows for and encourages the inclusion of multiple socially constructed realities. (Alexakos, p. 33)

Initially the use of authentic inquiry was in response to my understanding of the negative impact of positivism in our lives and particularly in education. I was also influenced by the Guba and Lincoln book Naturalistic Inquiry (1985) and by Ken Tobin and Joe Kincheloe in their 2009 article The Much Exaggerated Death of Positivism.

[8] The IRB or Institutional Review Board plays an important role. It provides researchers with clear guidelines on ethical research. It is not unknown however, for the IRB to step out beyond

its intended role and make judgements on what it considers as research, and to delay approval where applicants work does not conform to a specific methodology. The importance of the IRB is explained in the Belmont Report (1979). IRBs have themselves been going through a process of change given the significant increase in the amount of authentic inquiry that is taking place. Approval of research often takes place within a positivist paradigm, thus judging many researchers in the social sciences with incompatible criteria.

Mitch Bleier (in publication), in his article The Double Edged Sword: Walking the Line between Ethical Research and Regulatory Overreach., describes the challenges faced as he struggled with the approval process and encountered considerable resistance to the structure of his research and even challenges to the research itself.

[9] School Safety Agents came under the umbrella of the New York City Police Department in 1998. They were formerly part of the Department of Education. They can make arrests and use physical force to keep the school personnel safe. Many schools have scanners that students and sometimes all members of the school community are required to pass.

[10] This idea highlights one of the issues that frustrate mathematics teachers in New York City schools and elsewhere. The sacrifice of quality for quantity is ongoing, even with the new Common Core Standards. If we want quality learning then students need time to solve problems and build understanding of new concepts. Teachers are often required to adhere to unmanageable pacing plans despite often having groups of students who have not had a chance to consolidate their knowledge. When the Common Core Standards were introduced, they were accompanied by the 'Instructional Shifts'. (Engage NY, 2018) These six focal points address instructional practice in the mathematics classroom. The first shift is focus. Here they ask that teachers use the 'power of the eraser' and significantly narrow and deepen

the scope of how time and energy is spent in the math classroom. This particular shift is in response to past curricula being too broad, thus leaving students little time to master skills and concepts. It leads to the idea of curricula being 'a mile wide and an inch deep'. Unfortunately, the new curricula are not much better in this area and teachers found themselves having to make a choice between quality and quantity.

[11] The growth versus proficiency debate was highlighted last year when the Secretary of Education nominee Betsy DeVos was being questioned by Senator Al Franken. The senator asked the nominee which of the two approaches she favored. This has been a hot topic for years but it seems that the NYC DOE is at last acknowledging the importance of both. Schools and teachers are now being assessed on both criteria as part of their overall grade. This is a long overdue inclusion that will, in part recognize the work of teachers of students with intellectual disabilities.

[12] In 2004, The Individuals with Disabilities Education Improvement Act (IDEA) mandated that public schools develop an Individualized Education Plan for every student with a disability who is found to meet the federal and state requirements for special education. The thirteen disability classifications for IEP eligibility include autism, blindness, deafness, emotional disturbance, hearing impairment, intellectual disability, multiple disabilities, orthopedic impairment, specific learning disability, language impairment, traumatic brain injury, and visual impairment. Students with IEPs are often considered as students with intellectual disabilities, however at least half of the classifications do not involve intellectual disability. This has enormous implications for the instruction of students with IEPs.

[13] My research design allows for the use of methods such as prosody, dialogue, cogenerative dialogue, polyphonia, and polysemia, and a value system that welcomes the ideas and beliefs

of all participants. I will explain each of these here. Prosody is not specifically addressed in the research but it is something that is important to include as we try to make sense of what is going on.

- Prosody involves the patterns of stress and intonation in a language. It's about where the emphasis falls in the words and how those work together. While the use of prosody is not directly addressed in this dissertation, prosody is recognized intuitively and can set the nature of the tone in a conversation or dialogue.
- Polyphonia is a critical part of this research. It means that what is written is influenced by many voices, not just the voices of the writer. The stories, vignettes, and other writing in this dissertation are built from hundreds of voices, observations, discussions, dialogues, and experiences. While my writing is often written as seen by me, it also directly reflects the voices of many others.
- Polysemia is also a crucial part of hermeneutic phenomenology, the making sense if you like of the many events included in this work. There are many meanings to be taken from this research, and each will depend on our own ontologies and axiologies. You will draw conclusions based on what is written, and on your own experiences.

[14] These theories are at the heart of the work in this dissertation. Seeking out the disruptions in social equilibria rather than looking for conformity. We use event oriented inquiry rather than methods grounded in random sampling, statistical analyses, and generalizing from samples to populations. Tobin and Ritchie (2011) said that

As researchers we endeavor to find out what is happening in the fields of study ... We regard difference and sameness as resources and interpret each in relation to the other.

William Sewell Jr (2005) described the interpretive perspective of culture as having thin coherence and ever-present contradictions. If we consider the culture of a given school, superficially we might see a smooth organization where teachers are doing their jobs and students are learning. There is a good feeling as you enter the school. The contradictions appear as we look closer. They could include rumbles of discontent in the staffroom, or a teacher who is troubled by a bad evaluation. In fact these ‘ever-present’ contradictions are an important part of our understanding of a given culture. They are not something to be brushed aside, but are a valuable part of the hermeneutic phenomenology and contribute greatly to our research.

[15] The methodologies I adopt include ethnomethodology, event oriented inquiry, critical inquiry, and authentic inquiry. The goal is to document the methods and practices through which society's members make sense of their world.

- Harold Garfinkel (2002), said that ethnomethodology's goal is to document the methods and practices through which society's members make sense of their world. What more is there?
- Event oriented inquiry; William Sewell Jr. (2005) proposed a notion of culture's "thin" coherence, a coherence always at stake due to the unstable and varying applications made of it in practice. The events are ruptures in the cultural coherence and it is these that help us understand more about a particular culture.
- Critical inquiry investigates, reexamines, and challenges what is acceptable, and what is the norm, and seeks ways to reconceptualize and address these cultural assumptions (Alexakos, 2015, p.34). Foci of critical Inquiry include actions, values and morals, belief systems, and relationships of power, especially as they are being used to discriminate,

disenfranchise, or control others. As a methodology, critical research views society and its structures as not being neutral as was demonstrated in several of the vignettes in this study.

- Authentic Inquiry is situated in the world of lived experiences, and is transformative for the researchers, the researched, and the research itself (Alexakos, 2015). It is aligned to the Authenticity Criteria of Guba & Lincoln (1989) which honors stakeholder rights and ensures that stakeholder constructions have been collected and faithfully represented.

[16] The imposition and enforcement of a single idea on a community such as a school, rather than the celebration of the diverse and rich ideas of all participants is rampant in the public school system. I don't think that it really sank in until I began talking with and writing about George (Chapter 4). It was also clearly evident in research institutions and came to light for me during the IRB process when I was told by the reviewer that researchers could not be participants despite the fact that I was doing authentic research.

[17] The idea of serial and contingent selection is central to authentic inquiry. It involves the selection of participants not through a random process, but through a purposeful and subjective process that selects people because they are different, interesting, peripheral, failures, or highly successful. We sometimes select people because they would be rejected by a hegemonic regime and have been deemed as non-conforming. Such methods help us select participants who have something different to say or share and provide the researcher with valuable insights. My first exposure to the ideas of serial and contingent were during the course 'Logics of Inquiry' presented by Ken Tobin at the CUNY Graduate Center.

[18] Corporal punishment in Australian schools during the years of my schooling in the 60s and 70s was common place. The cane was the official method and was normally delivered by the deputy principal. There were numerous other examples that were not officially sanctioned and

these could involve a piece of chalk thrown across the room or an open hander across the back of the head. Nobody thought much of it at the time. If a student got caught violating a rule or norm, you could expect the punishment to follow. Such practices did not have any apparent impact on the bad behavior.

[19] Interestingly, my job with Generation Ready (the current name of the consulting firm that I work for), involves visiting schools throughout the New York City public school system to provide professional support. New York City schools use external support extensively, and have been doing so for some time. The extent to which NYC teachers collaborate is often impacted by poorly designed infrastructure such that teachers do not always have a place to get together over a coffee and share ideas. Such sharing is often done more formally and people attend because they have to, not because they want to.

[20] The following introduction is by Maria Van Den Heuvel Panhuizen, (2003, p.9) explains Realistic Mathematics Education.

> Realistic Mathematics Education (RME) is a domain specific instruction theory for mathematics education. This theory is the Dutch answer to the need, felt worldwide, to reform the teaching of mathematics. The roots of RME go back to the early 1970s when Freudenthal and his colleagues laid the foundations for it at the former IOWO2, the earliest predecessor of the Freudenthal Institute. Based on Freudenthal's (1977) idea that mathematics – in order to be of human value – must be connected to reality, stay close to children and should be relevant to society, the use of realistic contexts became one of the determining characteristics of this approach to mathematics education. In RME, students should learn mathematics by developing and applying mathematical concepts and tools in daily life problem situations that make sense to them.

[21] Algebra for All is an initiative designed by the NYCDOE that focuses on building algebraic habits of mind in students in middle schools and high schools across New York City. The program is designed to deepen content knowledge of critical areas that relate to algebra and learn, apply, and reflect on best pedagogical principles for mathematics. Professional coaches and consultants both from within and outside the DOE, work with teachers for a limited time to help achieve these goals.

[22] If we look at experienced teachers in the same study, the key findings were that;

- Over 70% of the most experienced teachers (those with 25+ years of teaching experience) are likely to retire over the next two years.
- Over 26% of mid-career teachers say it is unlikely they will be teaching in NYC in three years.
- Over 29% of new teachers say it is unlikely they will be teaching in NYC in three years.

[23] New York City only has a small number of the mega schools left. These include about 15 schools with greater than 3,000 students. Some of these are Brooklyn Technical HS, Franklin Delano Roosevelt HS, Forest Hills HS, Bronx Science, and Stuyvesant HS. Most of these schools have and A rating or higher.

[24] This chapter is written as a narrative. Tobin and Ritchie (2011, p.118) explain that narratives, like all stories, are not just descriptions of everything that happens. Rather they represent what happened that was considered most important and show how what happened interconnects central characters and events. Present tense used when appropriate.

[25] The challenges that students with disabilities have at school is exacerbated once they leave school and services in many cases are no longer available. Students like Nona will have lifelong challenges as they negotiate college and career.

[26] Kidney failure describes the gradual loss of kidney function. Your kidneys filter wastes and excess fluids from your blood, which are then excreted in your urine. When chronic kidney disease reaches an advanced stage, dangerous levels of fluid, electrolytes and wastes can build up in your body. Nona had reached the advanced stage prior to receiving her transplant. Nona put on weight because her diet was restricted to foods that were fattening.

[27] The model that is being suggested here is yet to be fully developed but, it firstly values teachers as colleagues. A model that is disrespectful is immediately destined to fail. Such collegial behavior must embed trust and respect. In this model, teachers are also respected for their knowledge and professional judgement. Evaluations are not done for compliance, but as a way of understanding the teachers work. Teachers are not assessed using a rubric written by one person, but using a combination of factors based on classroom visits and dialogue between the teacher and the principal.

[28] The Ministry of Education and Culture in Finland has designed vocational education and training (VET) for young people without upper secondary qualifications and for adults already in work life. Vocational qualifications can be completed in school-based VET or as competence-based qualifications. VET is organized mainly in institutions (on-the-job learning included) or as apprenticeship training. VET provides skills for both life and work. A vocational qualification gives general eligibility for university of applied science and other university studies but is not seen as a ‘second best qualification’. https://minedu.fi/en/vocational-education-and-training

[29] The German vocational education and training system, also known as the dual training system, is highly recognized worldwide due to its combination of theory and training embedded in a real-life work environment. Dual training is firmly established in the German education

system. The main characteristic of the dual system is cooperation between mainly small and medium sized companies, on the one hand, and publicly funded vocational schools, on the other. This cooperation is regulated by law. Trainees in the dual system typically spend part of each week at a vocational school and the other part at a company, or they may spend longer periods at each place before alternating. Dual training usually lasts two to three-and-a-half years. https://www.bmbf.de/en/the-german-vocational-training-system-2129.html

There is a growing awareness across Europe and all over the world that excellent work-based vocational education and training is vital for competitiveness and social participation. Demand from other countries for cooperation with Germany in this area remains high. To this end, the Federal Education Ministry supports initiatives such as the European Alliance for Apprenticeships launched by the European Commission.

Together with the relevant ministries from countries which also have a dual system (Austria, Switzerland, Luxembourg and Denmark), Germany has launched an online “Apprenticeship Toolbox” to provide support for decision-makers throughout Europe who want to implement the key principles of dual apprenticeship schemes http://www.apprenticeship-toolbox.eu/

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