Neurodiversity is Human Diversity, an Equity Imperative for Education

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Abstract

This article discusses historical system structures in education that have impeded on inclusion and present pertinent historical challenges, pedagogy and beliefs that are foundational in cultivating inclusive environments today. It explores Neurodiversity, an equity imperative, as critical to shifting the culture of teaching and learning by offering a potential framework for overcoming historical systemic barriers to inclusion. Next, it discusses shared attributes of epidemiology of teacher beliefs, neuroscience and Teacher self-study as potential foundational components, complimenting Neurodiversity paradigms. Lastly, a proposed theoretical framework and suggested future research which could lead to the development of an inclusive pedagogy. Education is the cornerstone to fostering talent and creativity of each individual and it is only when the system is truly inclusive of all human diversity, can individuals flourish developing their talents.

Keywords: Neurodiversity; neurodiversity paradigm; equity; inclusion; normativity; teacher beliefs; self-study.

Introduction

Engagement with the concept of neurodiversity is what imbues humans with sublimity of neurological differences as a required human variation. It asserts that these differences should not result in privilege or disadvantage, based on assumptions of normality, but to embrace neurological differences as a natural part of human diversity. The principles of the neurodiversity movement assert that it is dehumanizing to try to change or suppress neurological variations and these variations are not representative of disorders, diseases, defects, deficiencies, or dysfunctions. By the same token treatments that look to cure or suppress neurological variations, rather than support a person's self-determination regarding their own identity, are considered unethical. Judy Singer (1999) claimed that human minds are naturally diverse, with between-person variations being part of the rich tapestry of humanity. She proposed that disability may be a socially constructed oppression, a feature of being different, as opposed to ill or injured (Corker et al., 1999).

Education has a vital role in contributing to social constructs that encourage and enable individuals to develop their full potential. The neurodiversity movement provides a framework for how society, particularly educators, can view differences between individuals, transforming classrooms into equitable spaces for all students by rejecting cultural norms that are limiting.A respect for diversity is an essential part of education and requires the collaboration of teachers, parents, students, and the community to produce a working system seeking to optimize human potential for everyone (Fung, 2021). The purpose of this article is to analyze the state of inclusive education from a neurodiverse standpoint, exploring implications and perspectives for neurodiversity paradigms, to enrich teaching and learning for all learners. First, I will explore the history between inclusion and education with an overview of social, political, and structural components that contributed to the current underpinnings of inclusion-ish systems today. Next, I will analyze a) current structures and pedagogies that have potential to support inclusive education, b) Neurodiversity Movement as an imperative to equitable education, c) the theoretical implications of teacher beliefs on student learning and d) the role of neuroscience to support neurodiversity paradigms. I will conclude with recommendations for future research and suggested pedagogical practices. Inclusive education is not merely about inclusion of students with disabilities. Inclusive education is a means to enable all students to create meaning and develop passions for lifelong learning and creativity. It acknowledges human diversity and seeks to understand and appreciate differences between individuals to maximize each individual's talent potential.

History of inclusion and education

Education and inclusion have had a complicated relationship since the 1980's, when the system began to shift from an industrial system to a system that is 'child rights based.' The main premise of this shift was to protect the rights of the child, and this is when the field of special education began; an awareness of diversity was included in this shifting system (Vaghri et al., 2022). In 1990, the United Nations secretariat created the *'Conventional Rights of the Child'*- the most widely ratified human rights treaty in the world. The *'Conventional Rights of the Child'*, first ratified by 124 countries, represents a significant achievement of international norms and traditional values (1989). It aimed to ensure the rights of the children are in place to provide opportunity for each child to have potential to reach their full development (1989). This policy included an instrument, which outlined a framework of action necessary for implementation (Vaghri et al., 2022). According to article two, The Right to Non-Discrimination, Vaghri et al., (2022) states, "children have a right to education where legislative and policy measures are in place including appropriate training and support of teachers, to guarantee that no child is discriminated against in their right to access education"(p. 15).

The educational system, including teaching methods, curriculum, school design, and behavior policies, were enacted to promote, explicitly, the best interests and optimum development of every child (1989). Vaghri et al., (2022) affirms that "non-discrimination in respect of inclusive education, is a core obligation that must be implemented with immediate effect" (p. 20). Consequently, it has been over three decades since the development of this policy, and still, we are having the inclusion debate in education and society at large. This brings me to question on what the barriers are to evolving the education system into an equitable homeostatic system, where each person has access to quality education, as declared in the *'Conventional Rights of the Child'*? And why do ideologies contend to fundamentally understand, at the root, how everyone contributes to the success of inclusive policies, merely by how they interpret, implement, and holistically believe in inclusion? (Nilholm, 2020). As a result, inclusion consists of 'clustering' (or 'hubs' or 'mentoring') due to student achievement being solely based on what parts of curriculum educators deem as worthy of being learned, which is not actually inclusive. Similarly, quantitative data is produced based on summative assessments to determine who is valuable, who needs remediation and exposing students who do not fit into the system's prescribed paths.

For many students the results are catastrophic as they disengagement from their education, which affirms that schools work against inclusion through a process of bifurcation (Shen, 2020). Bifurcation is where empowerment of the masses generally takes the form of an authoritarian ruling class (Shen, 2020) produced by data production, tracking, assessment, and evaluation it cannot be changed within the system itself. In other words, one of the major issues in educational policy today is that policy initiatives at the federal and state levels are not consistent with the nature of the educational system (Shen, 2020). Instead, the power centers must rely on external means to create "order" to extract profit from it. This is where inclusion policies falls short, when it does not consider the societal and economic systems that have been in place for centuries.

> "Education as the practice of freedom—as opposed to education as the practice of domination—denies that man is abstract, isolated, independent, and unattached to the world; it also denies that the world exists as a reality apart from people."- Friere (2)

The 'banking' concept of education

The 'Banking' concept of education is a metaphor to education created by Paulo Freire (1970) to illustrate the oppressiveness of education. Freire (1970) states "education becomes an act of depositing, in which the students are the depositories and the teacher the depositor and knowledge is gift bestowed by those who consider themselves knowledgeable, upon those whom they consider to know nothin" (p.1). The meaning of this statement can be interpreted in several ways but the main idea is that people who have more power than the average person are then in a position to change the world around them for their own benefit. Education becomes a way for people to use power to oppress

another. The function of the banking system is to assure that the deposits do not deteriorate, as a result of contact with individual consciousness and the more students work at storing the deposits entrusted to them, the less they develop critical consciousness. In other words, the greater is the power of those who control it, over the 'individual consciousness' (Freire, 1970). Firere explained the Banker's concept attempts to conceal certain facts which explain the way human beings exist in the world by resisting dialogue and treating students as objects of assistance (Freire, 1970). It inhibits creativity and domesticates the intentionality of consciousness by isolating consciousness from the world, thereby denying people their ontological and historical vocation of becoming more fully human. (Freire, 1970); a true characteristic of the ideology of oppression as it fails to acknowledge people as beings (p.9). This sounds all to familiar in the context of inclusion and perhaps some parallel ideologies that exist. Freire (1970) understood education as inherently political, emphasizing that education is a struggle to the death between oppressors and oppressed (Freire, 1970).

The key problem for Freire was that the dominant cultural, social, and political system, did not support or promote the needs of individuals to exercise their human rights. Providing strong correlation to plausible reasons as to why inclusion policies are stagnant in the system and why inclusion is still a matter of debate. Illustrating that the ideology of oppression translates into a system which produces and reproduces hierarchical structures, as systems are built on the premise that everything can be reduced to simple binary oppositions. Freire understood education as essential to the development of persons, promoting a pedagogy that embraced critical thinking and the development of creativity (Freire et al., 2012; Knapp et al., 2011). I believe that until we fundamentally rethink the purpose of accountability of education, we will continue to rebuild the master's house with the same faulty tools.

The big data paradigm privileges a narrow, dysfunctional pedagogy: students in rows "ingesting" content, anxiety over grades (a signature Western classification system), and a strive to normative ideals that harms the principles of diversity. It's going to take a radical shift in approach to inspire the instructional transformation we need: deep, equitable, culturally sustaining transformation (Safir, 2021, p.22). Likewise, if educators do not understand or believe in inclusion because of societies normative values and practices, then inclusion policies will not achieve their purpose. And when there is an absence of awareness of exclusion within the system, then educators can continue to perpetuate the same destructive and oppressive policies and practices. Thus, compliance has become the default setting for many because of ignorance or fear to question authority, to challenge normative ideologies that continue to oppress the marginalized. The first step, then is for educators to be aware of their own limitations, particularly in the forms of coercion and indoctrination (Etherington & Boyce, 2017).

Korsgaard & O'Neill (2014) states, that to describe the importance of being normative, "is only a human species problem because humans can turn their attention onto their own perceptions and desires, onto their mental activities where they are conscious of them by the way they think about them" (p.93). The problem is that we do not know what 'normativity' and aspiration for normativity means because, as Korsgaard (2014) contends, "for our capacity to turn our attention onto our own mental activities is also a capacity to distance ourselves from them, and to call them into question" (p. 93). In a similar way, Brandzel (2016) explores that "normativity in a society succeeds because it utilizes and relies upon the premise of liberal democratic citizenship and its promise of soon-to-come-but-never arrive inclusion ..." (p.3).

The issue with a normative expectation, is that it creates a type of 'ideal citizen' which leaves those who don't fit the definition behind (Brandzel, 2016), and as discussed presenting a baking concept of education reinforced through the banker's model of education. Brandzel (2016) espouses, "there are modalities of differential responsibility and accountability for all of us" (p. xvi). To challenge the status quo of conformity and to call for the accountability of 'bank teller' educators to those that have been historically oppressed is essential to transforming education into a more equitable and inclusive system centering the human.

The neurodiversity movement

The Neurodiversity Movement aims to promote a greater acceptance for neurological diversity and a way out of the prejudicial view that individuals who are different from the norm are less valuable (Milton et al., 2020). This way of thinking and knowing challenges the accepted societal norm because it is an ideology that focuses on celebrating individuality, equality, and autonomy despite more than half a century of pathologies framing neurodivergence. The current climate of neurodiversity has developed into a greater discourse of equity for people who do not fit the normative stereotype and is increasingly being used in psychology and education as an umbrella term associated with autism, dyslexia, dyspraxia (or developmental coordination disorder), ADHD, dyscalculia, and other neurological diversities (Fung, 2021). Milton (2020) explains how "current world views tend to recognize that variety in every species benefits that species, and that 'error making' is in effect the same as exploration, be it at an individual or a reproductive species level" (53). Illustrating that there is no blanket prescription for all humans; rather, what is required is a wide range of choices in response to the varying specific needs of different individuals, and no one set of prescriptions for all can be validly proposed, especially in education (Milton et al., 2020). From this perspective, it is imperative we understand the spectrum of intelligence, the individualized capacity to engage in the world around us, and how that engagement impacts learning. Fung (2021) explains that,

> "Given the potential for varied degrees of neurological combinations... we can all be considered neurodiverse, rather than either neurotypical or neurodiverse. When they are used to describe such a dichotomy, these terms serve to replace and reinforce previous dichotomous understandings of "learning differences." However, neurotypical and neurodiverse currently serve as more progressive terminology to convey the wide variety of strengths that exist. What is considered pathology has now become a more complex discussion as the varying degrees of neurodiversity stretch our understanding of individual differences versus pathology" (p.40).

While human nature remains undefinable, it is undeniable that there are differences among individuals across the spectrum of human diversity. Indeed, too often the notion of "difference" as manifested in schools equates to individual deficit models, creating a problem and a spectacle of difference, to be managed and 'tolerated' by teachers (Milton et al., 2020). As a result, the presence of students positioned as 'different' is potentially contingent on their ability to provide an instructional service for their classmates (Milton et al., 2020), resulting in socializing students to ableist normative values. The dominant culture of society is heavily influenced by the pathology paradigm, where all kinds of diversity- whether physical or mental- is considered a "disorder" to be "cured" or simply just "different." Students being categorized into different deficit groups under the guise of providing psychomotor expertise, is upheld by several mechanisms, the most important ones being the professional division of labour and the 'machine bureaucracy' of educational administration (Nilholm, 2020).

Currently, there are two diagnostic categorization tools that are used across the world for diagnosis and research purposes, the Diagnostic Statistical Manual (DSM), 12 published by the American Psychiatric Association, and the International Classification of Diseases (ICD), 13 published by the World Health Organization (Smith & Kirby, 2021). These diagnostic categorizations can determine the most common diagnosis among individuals with a particular profile, whereas they are often used to determine eligibility for treatment as there is a clear distinction between the diagnosis in relation to severity of dysfunction. A criticism for the use of diagnostic categorization tools is that they represent over-pathologizing and a potential risk of pathologizing normal. The diagnostic label is one aspect of differential diagnosis for a range of problems. Individuals who align with these classifications may or may not be receiving treatment based upon their needs and circumstances. Even so, students in the education system, who fall under these classifications are still required to learn in accordance with the prescribed education policies, even if they do not fit into the established norms of literature.

To promote either a method of teaching (or learning) at the expense of a student who is unable to engage with the curriculum in that particular way is pathologizing (Jensen, 2021). Conversely,

pathology paradigms frame trauma responses as 'illnesses' creating a narrative to explain psychologically divergent experiences (Milton et al., 2020). The consequence is the presents of deficit models where the views about students being subjects, who must comply, are also present. Educators are encouraged to think carefully about how they might dismantle this paradigm among education cultures and to move into a more fluid discussion of concepts that sit outside the traditional view of normality. One perspective to consider is how the pathology paradigm, a medical model of seeing people as broken and needing to be fixed, is supporting, or hindering inclusion. It can often be predicted the way adults will treat children, simply from knowing what they believe about them. When the mantra is compliance, then we know there is divulgence from agency and from fostering a commitment to learning (Kohn, 2006). Compliance may reflect assertions, occasionally found in the literature, however, this is a explicit rejection of the academic literature on the nature of humans (as discussed previously). When teachers come to understand the dangers of normative ideals, they are one step closer to engaging fully with neurodiversity. In this sense, in the absence of an agreed definition, we must realize that neurodiversity is not a person-free concept; it is a person-full one (Milton et al., 2020). And it is here that the rubber really meets the road in the current paucity of empirical evidence on how best to develop neurodiversity imperatives in schools. I believe the Neurodiversity paradigm has the potential to lead oppressed groups to an eradication from societal hierarchy as it creates discourse of the structural oppression of people who do not fit normative ideals.

The individual needs of neurodivergent students can be better understood if their relationship when diversity and equity is considered. For example, the intergenerational oppression of neurodivergent families, where parents experienced marginalization by the school system that was trying to "fix" them, now correlates with the same challenges that their neurodivergent children are facing, in that very same system. Education has a significant role in changing patterns of inequality and is one of the major drivers of intergenerational social and income mobility creating a two-sided effect, when it comes to intergenerational transmission of disadvantage (OECD, 2012). The power of these narratives as an advocacy tool has been silenced for a long time due to ableism, tokenism and the fundamental belief that marginalized (neurodivergent) populations are incapable. To flip the script is going to require professionals, in the education system, who have had their own humanity expanded, not those without the capacity to be compassionate or show vulnerability in the face of uncertainty. It will require a culture where equity policies and practices create inclusive spaces supporting human diversity as a biological reality. It is when we consider the context that our differences can make a difference; that neurodiversity can be explored from a complexity perspective.

Moreover, these findings are not confined to education; in my view, they have the potential to influence how difference is understood and represented more broadly (Darling-Hammond et al., 2019). Neurodiversity is about embracing diversity not about discarding it or hiding it. It calls for Critical educators who will explore the intersections of neurodiversity and how to make them a powerful tool for equity imperatives. The school system must remain relevant to serve the current generation of learners where effective schools, with adequate resources and facilities, and well-trained personnel able to engage all students in their learning (OECD, 2012). By this vein, positioning students as learners, to exercise choice and agency, and who are encouraged to actively participate as their inherent right has the potential to foster marginalized students and families to rewrite their identities reclaiming their right to learn.

Teacher beliefs impact on student learning

Educators' beliefs about how students learn is vital when it comes to creating an inclusive and equitable education system. However, if educators do not understand or believe in inclusion because of societies normative values and practices, then inclusion policies and equity imperatives will fail to achieve their objective. Thus, the first step is for educators to be aware of their own limitations, particularly in the forms of coercion and indoctrination (Etherington & Boyce, 2017). Educators must be self-critical, reflective, and aware of their teaching practices to understand how they interact with student learning. The role of the educator must be a more dynamic one that does not rely on solely prescriptive and uniformed thought to design learning experiences. To achieve this, educators need to

distance themselves from their own biases, and reflect on how these are manifested in their pedagogy as norms and assumptions of teaching frames how educators respond to neurological differences in their classrooms (Fung, 2021). The challenge here is that educators must be able to see the connections between the various representations of data to use as an evaluation of impact on learning and to uncover potential biases. Hattie et al. (2021) describes that

> "Evaluation is about knowing and utilizing the skills needed to evaluate our impact on student learning through multiple methods of assessing. This includes assessment as learning, for learning, and of learning... the power of evaluation lies in how we interpret the evidence and what we do with our knowledge of student progress in learning" (p. 103).

Here is where educator understanding of Neurodiversity becomes pivotal in being able to differentiate between the student's learning process and teacher bias based on evidence the understanding of that evidence; otherwise, they will just continue to propagate the status quo. Emerging research highlights the importance of the psychology of teachers in shaping educational disparities. In the review, "Beyond students: how teacher psychology shapes educational inequality," Turetsky et al., (2021) synthesized international research on the role of teacher cognition in perpetuating or educational disparities and the potential contribution to educational inequality (Turetsky et al., 2021).

The review concluded that the effects of teachers' disparate assessment, interaction, and impact on educational inequality are not only immediate but can also proliferate recursively over time, such as causing students from marginalized groups to feel distrust and apprehension towards their education experiences (Turetsky et al., 2021). This research highlights ways to mitigate or eliminate such educational disparities are necessary and that teachers play a critical role in this transformation. Turetsky et al., (2021) call for teachers to "reflect actively on their educational worldviews, and the assumptions that underlie them" (p. 707). By doing so, teachers can begin to question the justifications and rationalizations that support their biases or expectations about student learning.

Most school districts in Canada and the United States have their own inclusion policies with accompanying regulations, to establish among practitioners how an individual student is to be educated with dignity, respect, and individualized opportunities for maximizing their potential (Nilholm, 2020). However, the OECD (2012) reported "the idea that students fail because of their own personal shortcomings (academic or otherwise) is being superseded by the idea of school failure. The cause of – and responsibility for – students' failure is now seen increasingly as a deficient or inadequate provision of education by schools and by extension, school systems" (p. 17). This can be seen as a false dichotomy where one cannot exist without the other, but because of society's ingrained beliefs and practices, they must be addressed and understood.

To begin to understand these perceptions of what educational failure is, educators must first understand why students experience failure. Students are not failing because they are unable to learn, or they have inherent personal shortcomings (which the earlier paragraph from the OECD refers to) but that their learning is inhibited by factors outside of their control such as teacher beliefs about who they are as learners. No educator wants to find out that their practices or beliefs may be marginalizing students or contributing to inequitable outcomes. But that fear—or worse yet, complacency and comfort in current practices because they work for "most" students—prohibits progress and perpetuates inequities and inequality. What this means is that educators can end up standing in the way of students' education who are marginalized by societal norms, based on the foundations of their beliefs and biases about student learning.

Our current task is to use teaching practices to actively support the learning of all by raising ethical issues of access and accountability. This is the pedagogical imperative that we must bring to students, classrooms, and schools as we recognize that each student needs to be included in their learning process so they can become critical thinkers who live, work, and thrive in the constantly changing world.

Neuroscience as an equity imperative

Learning science includes a wide range of fields such as neuroscience, psychology, and education (Frank Fischer et al., 2018; Tokuhama-Espinosa, 2008). Sawyers (2008) explains:

> "The goal of learning sciences is to better understand the cognitive and social processes that result in the most effective learning. To use this knowledge to redesign classrooms and other learning environments so that people learn more deeply and more effectively" (p.1).

Neuroscience provides the foundational knowledge of what goes on in the brain as one learns (Chang et al., 2021) and this understanding has the potential to change the teacher-student relationship and in turn our relationship with each other, as it sets the stage for understanding about the learning process (Tokuhama-Espinosa, 2008). The neurobiology of learning and the core concept of plasticity have the potential to change how we view teaching and learning, and ultimately how it affects student thinking about their own learning and sense of self (Chang et al., 2021). Such a concept of the brain being pliable and malleable is what makes it so important for educators to understand. If a student's neurobiological systems are at the core of their learning (Chang et al., 2021), then using the right teaching strategies and understandings of who students are as learners regarding knowledge, skills, and abilities will help them progress and thrive, diversely.

The concept that neurological differences can be natural development processes, and should not be considered disorders, is a recent development and current research has focused on the relationship between Neuroscience and Education (Darling-Hammond et al., 2019).

Neurodiversity, as part of this discourse has implications to advance equity for students who, historically, have been marginalized in the system. The early twenty-first century has brought huge changes in technological, cultural, political, and societal spheres. We have more knowledge of neuroscience, biology, and psychology than ever before. It is time for the education system to change the way it views disability and difference, and particularly to change attitudes towards neurodiversity (Smith & Kirby, 2021) by infusing neuroscience as a foundational pedagogy in education. Inside the classroom, teachers have the pivotal role of cultivating a classroom that supports the unique needs of each learner.

Modern research has shown that not only do our brain structures differ considerably but also how we use these structures change according to our environment, experiences, and social interactions (Darling-Hammond et al., 2019). Neuroscience has also challenged the doctrine of the way humans learn by showing that there's a complex genetic patterning to the brain (Thomas et al., 2021). Thomas et al., (2021) explains how:

> "Today, scientists are tracking the sources of knowledge with the powerful tools of neurocognition…and neurocognitive philosophy in teaching and learning [because] universally, education is aimed at preparing future citizens to the world of work and equipping them with necessary survival skills to face undefined challenges. This is in the hands of the teachers" (p. 182-183).

In a sense, neuroscience offers a more holistic and scientific understanding of learning than the traditional "hard" data from experimental psychology. In the study, Neuroscience Concepts Changed Teachers' Views of Pedagogy and Students, Chang et al., (2021) demonstrated that the use of neuroscience in the classroom deepened elementary teachers' "understanding of student knowledge construction and supported teachers to be able to justify their pedagogical decisions, positively impacting student achievement" (p. 15). Ultimately for those teachers, when looking through the lens of inclusion, it can be argued that neuroscience contributes to a framework that can help teachers explain student behaviors and understand the impact of students' emotions on learning and development. This helps teachers organize actions in response to specific contexts (Chang et al., 2021; Donohoo et al., 2020; Sawyers, 2008). The learning part of that process is centered on how people ascribe meaning to their experiences and includes the development of meta-cognitive skills Darling-Hammond et al., 2019).

In terms of neurodiversity, this suggests that the diversity of humans is a rich source of meta-cognitive experiences and reflective practice (Milton et al., 2020). It could be argued, from this perspective, that being different can also be viewed as a source of teaching and learning. Teachers often have certain expectations for their students, based on factors like the age, grade level or previous performance that can hinder students' performance. Whereby using pedagogical frameworks that are aligned with neuroscience, teachers will be able to align each student within the learning process using a strength-based lens. Therefore, understanding neuroscience is an important element of teachers' ongoing professional development and to creating equity in education. By studying human brain function, researchers are improving our understanding of how changes in brain function underpin developmental changes in cognition and emotion. In view of this growth in our understanding, there continue to be calls for this scientific knowledge to inform education (Nilholm, 2020; Darling-Hammond et al., 2019). In the above, we can consider how a study of how the brain relates to cognition and learning and how this relationship changes how development impacts educator's understandings of learning (Thomas et al., 2021; Guerriero, 2017). Suggesting that teacher reflection is possible and, at the very least, that working through some of our assumptions about difference can enhance our understanding of human diversity (Ainscow, 2020).

Teacher self-study

Teacher self-study is an assessment process in which educators evaluates their own practice and its impact on student learning where the role of the self in study does not focus on the self per se, but on the space between self and the practice educators engage in. Within the process there is always a tension between the two elements, self, and the arena of practice, between self in relation to practice and the others who share the practice setting (Bullough, 2001). Therefore, when educators create change it is important to identify the mechanisms used by them to do so. The self-study is the process of self-discovery that assists educators in understanding their own values and beliefs, strengths, and areas of improvement (Bullough & Pinnegar, 2001). Self-study teachers reflect on research and on their personal experience to guide a lifelong process of ongoing professional development (Hamilton et al., 2020). Professional development should promote inner work that supports the formation of healing-centered learning spaces (Casimir et al., 2020) building teacher efficacy by encouraging teachers to be agents of their own learning and reform initiative (Donohoo et al., 2020; Kohn, 2006). At the heart of self-study comes some of the hardest and most important work, working on oneself and collaborating with professional colleagues to improve daily and long-term work with students (Samaras, 2011).

Samaras (2011) explains that "self-study brings the envisioning process for education reform beyond the rhetoric to a reality where teachers work to study and apply their reframed knowing directly to their own teaching practices" (p.17). There is an astronomical benefit to the education system when educators understand themselves and their teaching as shaped by the social, cultural, and political influences in their lives and when they recognize how they have shaped and can shape the education system overall. This can open a space for conversations about educational reform rooted in equity and challenging the status quo because when those working within the system are continually engaged in the deeply personal and difficult inner labor, there becomes a collective strength to be able to unlearn and disrupt systems of oppression in our classrooms and schools (Casimir et al., 2020). Teachers who are able and willing to engage in self-study, have a rich resource of personal and professional development opportunities that can help them to co-create student centered classrooms that honor our students' identities, their inner lives and their many ways of knowing (Casimir et al., 2020).

Leading towards a better understanding of how identities are formed and how teacher identity can be such an influential part of an educator's life. By taking an understanding of identity formation, it allows us to see why the need for teacher self-study is so important in the learning process. Creating the most influential system of change by educators continually engaged in a study of their identity and practice will develop a mindset to assimilate new research and pedagogy into their teaching such as neuroscience and neurodiversity imperatives. Macro-level systems of oppression can be better

understood by engaging in the ongoing self-study of teaching. This can be achieved through the understanding that any teacher holds many identities, which are all socially constructed. Drawing from the literature on teachers' epistemic beliefs, it can be stated that teachers hold beliefs that guide and influence their actions (Bullough & Pinnegar, 2001). These beliefs can be either explicit or implicit. Implicit beliefs contribute the development of tacit knowledge, and teachers will not be aware of, and thus is rarely activated or evaluated (Feucht & Bendixen, 2010). Explicit beliefs are more visible and can be shaped through reflection and action. At times, the explicit beliefs of teachers will be out of sync with their actions, which can cause conflicting messages to students (Fives & Buehl, 2008). When dealing with teachers' personal epistemology, research focuses on the way teachers define, construct, justify, and construct knowledge (Feucht & Bendixen, 2010). Simply stated, a teacher's epistemological beliefs will determine the way educators' approach the learning process (Etherington & Boyce, 2017).

Having this understanding of teachers' epistemological beliefs is essential in developing teacher capacity to approach teaching differently. Here is where we begin to get to the crux of my argument. It is in the work that teachers do on themselves that they position themselves to be able to challenge assumptions and biases they many hold and to truly be able to see each person as they are, humanly (Erickson & Clarke, 2003; Brown, 2018;). Schools then can be problem-solving entities organised according to the challenges at hand and by this reflection, teachers will create more inclusive schools (Thomas et al., 2021; Knapp et al., 2011; Nilholm, 2020; Hattie et al., 2021). Many barriers have been identified in moving beyond the traditional notions of teacher identity. However, despite this trajectory for teacher self-study, there is still much skepticism about its value and worth. In my view it is naively optimistic to think that teachers can achieve anything without reflection and critique - whether we call them curriculum planners or self-study researchers, reflection and critique are fundamental aspects of good teaching.

To share our values, we need shared understandings, and yet, it is here that the challenges can be greatest. It is perhaps here that teachers might be best placed to share experiences with one another to provide a shared model for others to follow in a truly inclusive society (Thomas et al., 2021). Inclusion in schools has been challenging and has taken various forms in different school systems. Many have tried to develop inclusion models and policies, but it is only recently that the idea of teacher beliefs about students as a contributing factor to the success of inclusion attempts has surfaced (Fives & Buehl, 2008; Thomas et al., 2021; Etherington & Boyce, 2017). Teacher self-study has the potential to shift beliefs about learning and self -evaluation leading to an effective change in practice. And it is through reflective praxis that teachers will begin to see how individual thought around the very nature of what inclusion is has impact. Educators may be hesitant to evaluate their own work for fear of being biased. However, it is through the process of self-reflection that educators can be better able to balance individual concerns with group considerations. Vazquez (2021) contends that

> "Educator critical reflection towards purposeful action is essential for this effort as successful inclusion might largely be attributed to educators who redefine terms and practices such as identity, normality, intelligence, instruction, and classroom management while developing learning environments where all students belong, experiencing full citizenship, meaning they are considered valued, contributing members of the group" (p. 145).

It is in this way that educators begin to see how they can adopt new methods and ideas into their practice while growing their personal values and beliefs. In terms of the neurodiversity paradigm the role of teacher self-study as a foundational practice can create holistically inclusive learning environments because through self-study teachers can engage in understanding themselves and then their practice, their students, and the world around them (Turetsky et al., 2021; Thomas et al., 2021; Casimir et al., 2020). There is still a great deal of work to be done in shifting the focus from inequality to inclusion and it is still a very long road. However, by taking the time for self-study and learning about one's values and beliefs, both implicit and explicit, we can begin to learn how we may contribute to systemic oppression within our schools. We need to acknowledge that we are all socially constructed beings who hold beliefs about how the world works; these beliefs influence how we see

ourselves and other people. It is through self-study; we can learn how to recognize our own bias as well as how to develop a critical awareness (Hamilton et al., 2020).

Critical awareness is the key to achieving a paradigm shift in thinking; this shift in thinking will then create a shift in practice, which will lead to more inclusive teaching practices and inclusive student bodies (Thomas et al., 2021). Leading to a real change in the education process so that schools, along with all the other institutions of society, are more just and equitable for all their learners. As teachers, we are not only educators, but we are also social agents. We are asked to educate with a certain set of values and beliefs, which in many ways influence how students are treated and how we choose to teach.

Conclusion

So where does all of this leave us? It would seem, in the context of education at least, that notions of difference become inevitably enmeshed with ideas about ability - or the lack of it - the problems that students seemingly create failure to engage with the real world, which is assumed to be distinct and knowable (Milton et al., 2020; Darling-Hammond et al., 2019). For a long time, children have been put in a passive position and their unique voices have been overpowered and side-lined by adults, which we now know is harmful. We would do well to critically re-examine our education system, with the goal of dismantling the structural, curricular, and psychological purgatories that disproportionately ensnare marginalized students (Jensen, 2021).

This article is not intended to be a comprehensive snapshot of the literature on difference and teachers but a summary of the key themes such as the importance of self-reflective practice, the need to recognize the normativity of teacher practices, the importance of encouraging critical reflection to interrogate and promote anti-oppression pedagogy and the potential for Neurodiversity paradigms and neuroscience as a pedagogy to contribute to change. The next steps should include further research and experimentation in developing new inclusive models of education using diverse paradigms in which teachers can learn from one another, and through that process grow into educators who are equipped to support the humanity of learners. Neuroscience has the potential to offer insights into students' cognitive capacities, knowledge and skills that can help educators develop more effective teaching methods (Humphreys et al., 2018).

However, we also need to acknowledge that teachers are crucial to this imperative; as such we need to make a conscious effort to recognize that the process of teaching represents a unique opportunity for growth (Milton et al., 2020). The aim of this article was to emphasize, that the work of educators, based on their identity and difference theories, can help to create a more socially just and inclusive schools. In that vein, we need more research on teaching and learning in higher education - with a special focus on student experience and identity - relationships between teacher and learner, self-study in practice, neuroscience in practice with a particular emphasis on the educators understanding of the learning process.

We need to look at the teaching dynamic more closely, not just in terms of teachers' attitudes towards difference but also what they are doing with their own approach and practice (Erickson & Clarke, 2003; Evans & Kozhevnikova, 2011). Perhaps an emphasis on student experience (and its relationship to teacher knowledge) has been slightly overstated. It's not that teachers don't learn from their work with students - I know that I do. The difference is more about the way in which they interpret and are interpreted (Milton et al., 2020). Tokuhama-Espinosa (2019) examined contrasting views of educational leaders and learning scientists and their findings revealed "most humans conform to the status quo unless otherwise nudged... humans do not pay attention or question education policies because they presume if there was an important decision to be made, someone else would make it for them, everyone would be talking about doing it"(p.13). This is an important point, because it illustrates that even though Learning Science (and other pedagogies) have been available to education have been underutilized, despite being scientifically proven practices to enhance student learning. Tokuhama-Espinosa (2019) contributes this to individual choices and personal barriers which include semantics, heuristics, and access to information (Tokuhama-Espinosa, 2019).

We need to be thinking about how to re-organize our school systems structural roots so that omissions, which perpetuate structuralize oppression, can be investigated, questioned, and rectified (Jensen, 2021). It's important that teachers engage in self-study and reflection; to support students through the process of growth and development. This is key, because in order to be truly inclusive we must have a paradigm shift in our thinking, which will then be manifested in our actions (Cornwall & Clarke, 2003). We must empower students and ensure they have access to information and critical thinking skills so they can pursue knowledge that is relevant to their needs (Stell et al., 2019). But as Tokuhama-Espinosa (2019) contends, "it takes a truly bold educator to break from the pack and the risk-aversion that accompanies change. Most people are uncomfortable with "rocking the boat" or creating dissonance in the community, and therefore, safe inertia is prized over unstable change" (p.13).

Time and time again the calling for agents of change are heard across the educational landscape and culture, yet it remains to be answered. Fung (2021) attributes "successful diversity movements serve to change the culture by generating a wider acceptance of differences that results in a higher sense of equity and belonging" (p.9). Truly a paradigm shift in thinking will create a shift in practice which can lead towards call to action. It is harder to question why we are the way we are if we do not recognize the problems. It is harder to question what our system is doing if we do not realize it exists in the first place. A neurodiversity perspective can help educators shift from thinking about students as being, focusing on static attributes, to becoming, expanding identity to dynamic multiplicity in our humanity (Kuussisto et al., 2021). The neurodiversity paradigm fosters the spaces to create that change, as it embraces a multi-dimensional way of living and is about reclaiming life for people with diverse experiences, by changing the cultural paradigm.

Change is generally hard for anyone however, Fung (2021) explains that "if the environment is shaped in a manner that facilitates change, individuals will feel empowered, and the challenges encountered will be less overwhelming" (p.9). Afterall, as Nilholm (2020) argues, the "development of education is not an objective enterprise but is situated in democracy and tied to certain values" (p.362) and if meant to produce human cogs in a non-inclusive, non-diverse society, then we may already have the perfect system (Tokuhama-Espinosa, 2019). But if education is meant to maximize the potential of each student to learn, then perhaps we start harnessing the power of diversity within all of humanity. It is my contention that difference is a natural part of the world and it's our moral obligation in education, to not only acknowledge that difference but also to embrace it, exclusively.

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Colleen Dawson (they/she) is currently an educational leader with the Winnipeg School Division and has served education since 2014. Colleen has held a variety of educational positions including Vice-Principal, Inclusion Education Resource Teacher, Mentor, Classroom Teacher and as a divisional Support Teacher. Mentor/Coaching is at the heart of Colleen's approach to leadership and learning. In Colleen's current role, they engage educators in teacher learning inquiry cycles, analyzing educational research along with teaching experiences. They foster the development of in-depth pedagogical practices leading to intentional design of rich learning experiences for students. Colleen has been recognized by the Jane Goodall Institute for their work in the Roots and Shoots program, facilitating student-led investigations into local community sustainability initiatives. Colleen is a very passionate advocate for equity for the neurodivergent and LQBTQIA++ community, as a queer and neurodivergent person. They currently serve as the vice-chairperson for the Canadian Mental Health Association in Manitoba. Colleen can often be found chasing dopamine, tearing through forests on long runs with her dog, Arlo. Colleen and her two neurodivergent children, Riley and Charlee, typically spend their summers off-grid at their cabin in Nopiming Provincial Park, Manitoba.

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