Journal of Urban Mathematics Education
December 2021, Vol. 14, No. 2, pp. 42–70

Indigenous Struggle With Mathematics Education in the New Zealand Context: From Neo-Liberal Ontology to Indigenous, Urban Ontologies?

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In this article, the learning of conventional curriculum mathematics in one Indigenous Māori school in Aotearoa/New Zealand is conceptualized as a site of ontological struggle. The major finding of a research project which analyzed extensive ethnographic data gathered in partnership with this school identified an ontological disjunction between curriculum mathematics education and the ethos of the school. This disjunction can be related to the complex and emergent phenomenon in Aotearoa/New Zealand of Indigenous schools in neoliberal, capitalist urban conditions. Centering the ontological commitments of the Māori school challenges the ontological hegemony of curriculum mathematics education and points to a consideration of the possibilities of forms of contemporary mathematical education based on Indigenous ontologies. Embedded in the discussion is a consideration of the ethical position of non-Indigenous researchers working in Indigenous contexts.

KEYWORDS: critical culturally sustaining/revitalizing pedagogy, Indigenous educational sovereignty, Indigenous Māori mathematics education, urban indigeneity research ethics

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The focus of this article is on the ontological work that the presence of mathematics education based on a mandated national curriculum does in an Indigenous Māori school. The discussion is necessarily intimately connected with the Aotearoa/New Zealand context, which will be briefly outlined in the next sections. Aotearoa (the long white cloud) is the original, Indigenous name for the land now governed by the New Zealand State.

To be clear from the outset, this article is not about the nature of disciplinary mathematics knowledge, Indigenous mathematical practices (ethnomathematics), or pedagogical practices designed to improve Indigenous student achievement in the terms of the New Zealand national curriculum. To paraphrase Foucault (Dreyfus & Rabinow, 1983, p. 187), the focus is on what the "doing of curriculum mathematics education does" when located in an Indigenous, Māori school, itself embedded in a long-term emancipatory social movement complicated by living in neo-liberal urban conditions. This focus prompts an investigation into the ontological commitments of both the Māori school and the curriculum mathematics education as constructed through the social practices of both.

Urbanization and Urban Māori

New Zealand society is now a thoroughly neo-liberalized, capitalist society that has established a neo-liberal ontology as the basis of almost all social and economic life (Fisher, 2013; Harvey, 2005; Kelsey, 2015). National education systems have also been transformed as part of the establishment of a neoliberal, capitalist hegemony (Ward, 2012). Urbanization is understood as intimately and inextricably connected with capitalism and, in the early 21st century, its neo-liberal governance formations (Rossi, 2017). In New Zealand, colonization can be viewed as both a settler-colonization project and a capitalist project that has successfully created dependency on market transactions for survival as well as a predominantly urban-dwelling Indigenous population (Poata-Smith, 2015).

Māori have to a large extent migrated to urban centers, a process that intensified after World War 2 (Peters & Andersen, 2013). Now, over 80% of Māori live in towns and cities, with one quarter of all Māori living in Auckland, New Zealand's largest city, and one sixth living in Australia, with the greatest concentration in Sydney (Haami, 2018). Today, in terms of location at least, Māori can be described as an urban people (Kukutai, 2013).

In this migration to urban living, the nature of Māori identity has become contested (see Hokowhitu, 2013; Kukutai, 2007). Whilst genealogical connections to ancestral, pre-colonization communities and homelands remain central to being Māori, urban living has resulted in an emergent range of Māori identities and adapted social practices (Kukutai & Webber, 2017). Generations of Māori have grown up in urban centers and identify primarily with these locations as *urban Māori*, who are far from

a homogeneous group (Ryks et al., 2016). In some ways, urbanization has blurred the traditional cultural and spatial separation between Pākehā (European New Zealander) and Māori, but even so, Māori communities remain distinctive and centered on Māori values and practices. These practices have been adapted to urban conditions and maintain commitments to Māori ontologies, values, and epistemologies in novel and creative ways (Gagné, 2013; Metge, 1995). For example, Māori have created successful Māori businesses and business models (Mika et al., 2019), founded health providers (Durie, 2011), influenced the criminal justice system (Tauri, 1998), and established early childhood centers, schools, and universities (G. H. Smith, 2000).

Māori continue to resist neo-colonization and the toxic aspects of urbanization whilst taking advantage of the beneficial aspects by reorganizing the resources available to maintain Māori social practices, community integrity, and social structures (Keiha & Moon, 2008). In addition, Māori are developing sufficient strength politically and economically to renegotiate relationships with the state and the multicultural nature of general society (Gagné, 2016). This also positions Māori to be able to engage on different ontological and epistemological terrain with the challenges that face humanity in the 21st century. In relation to this article, this includes forging new relations with all existing knowledge domains, regardless of cultural location, and, in particular, the discipline of mathematics.

The perspective adopted here is that Māori schools are integral to this urban experience and are another example of how Māori have adapted to urban, neo-liberal conditions in ways that maintain Maori language and cultural reference points. The school that partnered in the research reported in this article was based on Māori language and culture but also dealt with events and attributes related to the school being situated within urban conditions. For the purposes of this article, Māori schools are understood in this context: they are part of a wide-ranging, multidimensional, Indigenous response to urbanization and the neo-colonial, neo-liberal subtext as a fundamental part of a Māori emancipatory movement.

Non-Indigenous Researchers and Indigenous Contexts

Linda Tuhiwai Smith explains that there has been a history of researcher abuse of Indigenous populations, which rightly sounds a warning and creates caution about the engagement of non-Indigenous researchers in Indigenous contexts (L. T. Smith, 2013). In Aotearoa/New Zealand, the broad research orientation known as Kaupapa Māori Theory has established itself at the center of research ethics and excellence with, by, and for Māori (Bevan-Brown, 1998; Pihama et al., 2015; G. H. Smith, 2009, 2011, 2012; L. T. Smith, 2005, 2011).

In this regard, two factors need to be considered. The first is the non-Indigenous ethnicity of the researcher. The second is the influence of non-Indigenous theory in the construction of analytical frameworks.

Who Is This Researcher?

The researcher was born and brought up in England and migrated to New Zealand in the late 1980s. Strictly speaking, because the author is not Māori, the research described here cannot be described as Kaupapa Māori. The researcher, however, has been closely associated with Māori schools and communities for over 20 years, has taught, as a fluent speaker of te reo Māori (the Māori language), in Māori schools and universities, and has created professional learning opportunities for Māori teachers in mathematics and science (Te Maro et al., 2008). Moreover, the researcher continues in and is committed to these relationships with Indigenous communities built up over many years (Tweed, 2019). By marriage, the researcher is also connected to the Iwi (tribe) Ngāti Porou. The long association and commitment to te ao Māori (the Māori world) by the researcher through work, family, and social life places this non-Indigenous researcher appropriately for research in the Māori communities of which the researcher is already an accepted member.

The researcher also has a longstanding relationship with the Māori school that partnered in this research. This relationship was established well before the research was conducted and continues in the present well after it has been completed.

Non-Indigenous Theory and Engagement in Indigenous Research Contexts?

Whilst acknowledging the power and relevance of theoretical frameworks grown from entirely within Māori/Indigenous cultural spaces and communities, it is suggested here that this does not mean that research employing non-Indigenous, Eurocentric frameworks has nothing meaningful to contribute to Indigenous research. The use of theoretical frameworks created by European researchers/thinkers is not sufficient by itself to assert that the research is automatically Eurocentric in its entirety. Eurocentrism also entails that European/North American (Western) interests and outcomes as well as conceptual understandings are centered. Research using theory produced by European thinkers to critique this Eurocentrism counters oppressive systems that prevent the emergence of spaces in which Indigenous culture, language, and worldview are centralized. This signposts a direction towards an ethical position for non-Indigenous researchers working in Indigenous contexts.

The exclusionary stance by some scholars that dogmatically rejects research by non-Indigenous researchers and/or using non-Indigenous theoretical frameworks is problematical and ultimately unproductive. Several prominent Māori scholars have commented on this issue.

Te Kawehou Hoskins (2012) explains that Māori essentialism, which lies behind such dogmatic exclusions, has been a necessary political stance over the last 40 years in order to resist European-based cultural, material, and political dominance in New Zealand. She also contends that such a stance is unsustainable because it reifies both Māori and non-Māori identities and thereby cannot recognize the heterogeneity

of both Māori and non-Māori (the researcher and the participants in this research, for example, do not match these reified identities). Instead, Hoskins argues for an open, relational stance that accepts the potential and risks for new knowledge generation of engaging ethically with the non-Indigenous other and non-Indigenous knowledge frameworks.

In a similar vein, Stewart (2018) argues for the deliberate and critical working of the Indigenous-settler relationship. She refers to dualities between social reality and discourses that pervade Māori lives in all spheres of life, creating "hyphens" that she contends should be productive relationships rather than antagonistic and exclusionary. Stewart comments that

> Critical Māori scholarship is better off working with hyphens rather than against them. This can also be expressed as seeing hyphens, such as the Māori-Pākeha [Europeans settler] hyphen, not as symbols of either-or exhausting battles, but of both-and enriching collaborations. (Stewart, 2018, p. 773)

The research detailed in this article could be viewed in these terms as a critical and productive working of the Māori-Pākeha hyphen, which explores the tensions created by a duality established between the discourses of curriculum mathematics education and social realities of Māori.

For Te Ahukaramū Charles Royal, who has written extensively about Māori knowledge (mātauranga Māori) and epistemology, it is understood that

> …movement 'towards a new Indigenous epistemology,' at least in Aotearoa/New Zealand, will involve the development of a way of studying the nature of knowledge (and its attendant questions) that finds inspiration both in conventional Western epistemology and in mātauranga Māori. (Royal, 2009, p. 119)

Royal contends that contemporary mātauranga Māori can benefit from and inform other knowledge domains and proposes a new Indigenous epistemology based on contemporary forms of Māori concepts and practices, which has the potential to engage with any other domain of knowledge from a Māori ontological position. Although this is not an argument for the involvement of non-Indigenous researchers, it does carry with it an understanding that non-Indigenous people may be involved in a contextualized manner, that is, appropriate to the context of research. Here it is understood that in some contexts, non-Indigenous involvement is appropriate with sufficient ethical and cultural understandings, whilst in other contexts it is entirely inappropriate regardless of the competencies of the researcher. Moreover, it is for Indigenous communities themselves to decide on the appropriacy of such involvement in any given context.

In this regard, it should be noted that the research outlined in this article is not a purely Indigenous one; it involves the interaction between a Western knowledge system (curriculum mathematics education) and an Indigenous school in urban

conditions. There is an entanglement here that sees history as simultaneously both Māori history and Pākehā (European settler) history, with multiple and varied interactions, overlaps, and ambiguities. As Jones (2007) points out, there is also the possibility that multiple distinct and irreconcilable events occur simultaneously, resulting in an interminable tension" between them, which may be the case in this research.

Penetito (2010) contends that Māori education is in fact circumscribed by government, majority culture concerns, policies, and agency. Māori schools are still charged with producing the same outcomes as any other school in addition to their efforts towards emancipation. In this context, both Indigenous and non-Indigenous theoretical frameworks have a place. Te Maro (2019), for example, uses both Foucault and Marx to reveal how curriculum mathematics education confines time, space, and subjectivity to the instrumental domains of the economy. She argues that Indigenous frameworks must drive development of Indigenous communities from the inside, but Western theory can be powerful in the analysis, and therefore minimization of harm, of systems that impinge upon/oppress Māori from the outside.

Thus, it is considered here that the use of non-Indigenous frameworks in Indigenous contexts is challenging but, with care, critical engagement, and cognizance of the history of the Māori/Pākehā relationship, potentially productive. This care and critical engagement with theory involves the researcher as bricoleur, carefully attending to how concepts from many disciplinary domains are reinterpreted and relocated in the research context to create robust and rigorous research methodologies (Kincheloe, 2001, 2005). Done well, the use of non-Indigenous theory can support the purposes of Māori communities and maintain their centrality whilst generating useful knowledge of interest in other contexts. Kaupapa Māori research prioritizes the usefulness and ownership of the research but maintains an open stance about the methods used (Moewaka-Barnes, 2015). The Māori school involved in this research certainly owns this research and continues to use the findings to develop its own approaches to engaging with mathematics.

Having argued for the conditional legitimacy of non-Indigenous researcher involvement in Indigenous-oriented research (conditional upon context), more remains to be unpacked about the nature and ethics of this involvement. The "doing" of research always comes under an ethical umbrella, the importance of which is amplified when non-Indigenous researchers engage in Indigenous-oriented research. Here, I will draw briefly on the work of Biesta (2015) and Yukich and Hoskins (2011), who are inspired by the philosophical work of Levinas's concept of ethical responsibility for the other (see Levinas, 1961/1969, 1974/1998).

Biesta (2015) critiques what he describes as the dominant discourse of learning on the grounds that it positions teachers and students (and people in general) in a particular relationship with the world. In this relationship, we are meant to grasp and know the world in its entirety and to continue learning until this is achieved. The world, which includes other people, is, in this view, a thing that is at our disposal,

subject to and an object of our knowing. This relationship is a form of possession. Instead, Biesta argues for an education that allows us to be confronted by the world and for us to be taught by it. In this relationship, the world is not positioned as a thing to be known but as an entity with its own purposes and actions that in certain aspects must always remain unknowable to us.

Yukich and Hoskins (2011) take up this Levinasian perspective in the context of Pākehā school principals who have developed competencies in engaging with Māori communities. The central theme here is that these principals developed practices of simultaneous knowing and not-knowing with respect to Māori. Over time, they developed understandings of language and practices and were able to participate competently in them. At the same time, this knowing automatically highlighted what they, as Pākehā, do not yet know and can never know. The position suggested here is an ethical one. Whilst learning from Māori and developing cultural competencies and responsivity as non-Māori is pursued, this must not be a pursuit of ownership, possession, and control. It must rather be a pursuit of self-knowledge precisely so that an ethical care for Māori, as the other, can exist, which reminds "…dominant groups such as Pākehā to resist the will to mastery, the desire to wholly know and 'see' others… to protect the radical alterity and the cultural difference of others" (Yukich & Hoskins, 2011, p. 63).

Taking up this same ethical position in Indigenous research, demands that non-Indigenous researchers, even as we gain valuable insights and generate new knowledge and understanding, acknowledge the historical relationship that has existed between Western research and Indigenous communities, a relationship which L. T. Smith (2013) describes as a claim to ownership of Indigenous ways of knowing and being and a rejection of the people who created them. This entails the understanding that the knowledge generated by research is not knowledge of the other but knowledge for the other, spoken inevitably from a position of power but spoken in such a way that attempts to simultaneously challenge this power; it is spoken by the non-Indigenous researcher without expectation of reciprocity, without any expectation that it will be implemented. Resisting the will to know here means that the non-Indigenous researcher offers their work not as a claim to truth but as a tentative possibility, a suggestion of possible meaning always prefaced by statements of fallibility and subjectivity. Indigenous people and communities may accept or reject such work on their own sovereign terms (which always remain partially unknowable to the non-Indigenous researcher). Research becomes a mixed practice of tentative knowing, speaking, and deliberate ignorance.

Research Methodology

The overall aim of the research was to infer ontological commitments from social practices operating in mathematics classes and in the general operation of school life (the ethos). Since the researcher already had an established relationship with the partner school in the research, an ethnographic methodology was used. The researcher spent a period of 12 months collecting data from classroom video recordings, individual interviews, focus groups, and field notes.

Analysis of data employed concepts taken from Legitimation Code Theory (LCT; Maton, 2014), recontextualized to suit the Indigenous context of the school. The main concept employed from LCT was that of specialization, which refers to the ways in which social practices specialize a person's subjectivity. LCT informs the analysis by alerting us to the nature of social life as involving (amongst other things) a specialization of the relation to knowledge and a specialization of the relation between people. Thus, analysis of data involves asking the following question: what kind of epistemic relation (how knowledge is understood and is to be acquired) and what kind of social relation (how people live with each other) are legitimized in the social field?

LCT further recognizes two forms of each relation. The epistemic relation is considered as ontic or discursive, indicating a direct relation to the object of study (ontic) or the study of an established discourse about it (discursive). The social relation is considered as subjective or interactive, indicating social practices based on belonging to a certain group (subjective) or based on ways of interacting (interactive).

These concepts come together by viewing social fields as having characteristic configurations of how knowledge and knowers are structured, which in turn specialize subjectivity in particular ways (Maton, 2006). The specialization of subjectivity is considered to be equivalent to an ontological commitment to a certain kind of person constructed through participation in the practices of that field.

Findings and Discussion

Throughout analysis of empirical data, these specialization concepts were recontextualized and sharpened for the Indigenous context of the school. The ontic epistemic relation was reinterpreted to correspond to direct experience of students and teachers in real event (a participatory epistemology) as a preferred form of knowledge generation and learning for students. The discursive epistemic relation came to mean an engagement in a formalized knowledge discourse about an object of study rather than a direct engagement with that object of study. Similarly, for the social relation, a subjective social relation came to mean the possession of genealogical links to tribal ancestors (of any Iwi/tribe), and an interactive social relation became a focus on

explicit, institutional/disciplinary specific rules of behavior/interaction between people, regardless of genealogy.

This led to the major finding of the research: the overall specialization of the whole school ethos was based on an ontic epistemic relation and a subjective social relation, but the specializations in mathematics classes were based on a discursive epistemic relation and an interactive social relation. In other words, the school ethos was about an engagement with the world as it currently exists from a position of Indigenous inclusion in ways (both formal and situational) dictated by the nature of this engagement. Curriculum mathematics education was about mastering the existing discourse of curriculum mathematics from the position of a generic learner.

The following sections present some examples of empirical data, with interpretations in italics relating them to specializations of the school ethos and three mathematics classrooms.

Quotations appear in English, but the original data was entirely in te reo Māori (Māori language). This presented the methodological problem of how to maximize the fidelity of the English translations. This was accomplished by an iterative process of collaborative translation and checking with participants (who are all bilingual speakers of Māori and English) until participants confirmed that the English version conveyed the intended meanings.

The School Ethos

The school is small, with around 120 students and six full-time teachers. It is located in the center of a medium-sized town and has the full range of students from age five to 18. Students come from a wide variety of socio-economic backgrounds, with all of them being Māori and being able to function in a cultural context in which Māori language and cultural practices are centralized.

The school is a second home for students, teachers, and their families. It is common for teachers, students, and visitors to sleep overnight in the school. There is a supply of mattresses and bedding for that purpose. Teachers and students have a responsibility to look after the school as if it were their home. The caring of the grounds and buildings of the school is direct; responsibility for its upkeep rests with everyone who lives in the school.

Interpretation:

Although the school is small, it caters for a full range of students from all socio-economic groups in the town. Being Māori and forming a community based on Māori cultural protocols and norms (tikanga) is a way in which the school responds to urban conditions and the wealth disparities that have been exacerbated under neo-liberal reforms over the last 40 years. This has a clear association with a subjective social relation.

The school has a particular orientation towards students being kaitiaki (custodians) of their lands and natural resources, being upholders of the Māori language, and being exemplary representatives of their Iwi (tribe). Quoting a kaumatua (an elder, Koro[1]), one teacher, Te Mana, made this statement:

> Koro says that we must learn all of the real (Māori) names of places and the histories of them in our Iwi (tribal) area. If we don't, we will be just like the Pākehā (European New Zealander), who are only visitors to our lands and will soon be gone.

Interpretation:

The social relation includes a relation between people and the land. Being Māori and having an ancestral connection with the land on which you stand gives a more nuanced understanding of what a subjective social relation means in this context.

The school operates on the basis of tikanga (culturally correct actions), which are not written down as a set of policy statements. Tikanga are culturally correct actions learned through participation in real cultural activities. Several comments from various teachers during family and staff meeting reiterate the prioritization of language and tikanga. The prioritization is certainly related to both a need to protect the Māori language and tikanga Māori as well as a response to perceived oppression. Two such examples are given here:

> What's important is that our own knowledge is fed to our children… we have been oppressed for long enough by those external systems that tell us what knowledge we should be teaching and how we should organize ourselves

> What's important is not math, it is the Māori language... mathematics is not endangered; it can look after itself and will be there when we are ready for it... if we don't speak Māori, it will die.

Interpretation:

The strong desire to base all aspects of school life on Māori philosophy is clearly expressed here. Tikanga relates to an underlying Māori worldview (ontology) that recognizes language as a fundamental aspect of how Māori relate to the world and think of themselves in it. The frustration with external systems, including curriculum mathematics education, is also clearly expressed. The desire to relate to the world not through external knowledge systems but through an autonomous Indigenous ontology characterizes a strong ontic epistemic relation in this context. The recognition that mathematics will look after itself recognizes its discursive nature, but Māori language and Indigenous knowledge have a high degree of ontic urgency about them—the ontic imperative exists for them to survive.

[1] All names are pseudonyms.

A general feature of the school is a prioritization of naturally occurring, experiential learning. Priority is always given to real cultural events, such as pōwhiri (welcome ceremonies) and tangihanga (funerals). Often the whole school will travel large distances in order to attend such events. The school is a genuine cultural institution in its own right that engages in actual cultural life. It is already embedded in the wider cultural constellation of the Iwi and in this sense is much more than just a school. Celebration of times of the Māori calendar are real participations. For example, the celebration of Matariki in June or July (the beginning of the Indigenous new year in the southern hemisphere winter) is not a school learning experience but a genuine celebration of the changeover of a natural cycle in Aotearoa/New Zealand—it is a cultural connection with the land, a recognition of change and the continuing presence of ancestors. One teacher commented on it in this way:

> Participating in Matariki reestablishes a spiritual link with ancestors. In the early morning, it is still dark, its cold... the connection is easier to make... somehow Nanny is close, and I remember her and mihi [greet] to her for all that she has done for us... she is still doing it right now actually.

Interpretation:

There is a strong sense of the immediacy and authenticity of this event. Teachers and students experience a closeness with ancestors at this time. This can be related to a strong ontic epistemic relation; teachers and students participate in this event and experience it in all aspects of their being—intellectually, emotionally, physically, and spiritually. The learning is both collective and personal, but it is not reproducible in precisely the same way. This represents another important difference from a curriculum mathematics discourse, which to a large extent is about ***fungibility****; students are expected to pass through the levels of the curriculum and emerge at the end in possession of similar knowledge, skills, and dispositions. From a curriculum mathematics viewpoint, students are effectively interchangeable, a situation which is consistent with an economic demand for cohorts of students who have been equipped with necessary knowledge and skills for employability.*

The relationship with the New Zealand national curriculum is ambivalent. One teacher commented as follows:

> The [national qualifications] are done as quickly as possible so that we can get on with what really counts... developing students as Māori people located in a Māori reality.

Officially mandated knowledge is seen as an imposition in some respects, but this is completely consistent with the school's basis on tikanga and real learning through real cultural participation; time spent on curriculum learning is time taken from the main purposes of the school. Students must have qualifications in order to gain access to university or other tertiary training or employment, but the real job of the school is to grow Māori speaking and thinking people.

Assessing students against external measures based on the age of students, such as the levels in the New Zealand national curriculum, is rejected. The principal of the school expressed it in this way:

> It feels like a real intrusion, an intrusion of judgmental thinking into our family where the development of our tamariki-mokopuna (children and grandchildren) as people is the most important thing.

Despite a strong tendency for integrated and thematic approaches throughout the school, mathematics remains as the most defined standalone learning area. All teachers have dedicated times when mathematics learning happens in isolation. There are also dedicated assessments of students.

Interpretation:

This illustrates the mixed and somewhat confused discursive nature of societal attitudes to knowledge even in Māori communities. Urban conditions make the necessity to gain employment paramount, and competency in mathematics is seen as fundamental to this economic imperative. Both families, teachers, and students carry these discourses about the universality of mathematics and its importance to "everything" into the school. Resisting this pressure from outside takes a lot of energy. The desire for a different form of mathematics education is very apparent and represents a manifestation of the clash between ontic and discursive epistemic relations.

The principal also commented on a mismatch between family interests and the school ethos in relation to mathematics:

> Even when we report how well children are doing in terms of growing and learning in their Māori identities, like growth of manaakitanga (caring), tautoko (support), and mātauranga Māori (Māori knowledge), they still want to know where their child is in mathematics. I think even if we reported about integrated mathematics, they would still want to know about basic facts and levels... and it's all pressure from outside. It's not our kaupapa (reason for being/purpose), it doesn't belong to us. If the compliance thing wasn't there, mathematics could be very different.

Interpretation:

This highlights the disjuncture between the ethos of the school and mathematics classes, which remain outside the integrating themes uniting the rest of learning in the school. This is a clash between the ontic epistemic relation of the school and the discursive epistemic relation of the mathematics classes. The rejection of assessment against the levels of the national curriculum also emphasizes the ontic epistemic relation; for this school, students (and people in general) develop knowledge at their own pace through their own experiences over time and in real events. This cannot be hurried or planned ahead in a step-by-step hierarchical structure.

The principal expresses a very strong feeling of frustration with the need to comply with external regulations, especially the national curriculum. The thinking is certainly present that the school should create its own curriculum. Coupled with a rejection of a curriculum that is designed in levels that are used to measure students' learning, there is a desire to ground any new curriculum in the local Iwi context. One teacher put it like this:

> I went through an English-medium school, and the teachers knew exactly what we were going to do each lesson... but that destroyed my creativity... it was like I couldn't have my own thoughts... that's why I think it's better for us to create our own curriculum, so that the people who are based here, who live here, decide what's in it and how its organized... how it can be planned so that the students are alive in it.

Interpretation:

Again, the tension and the sense of constraint and oppression through external regulation is clearly expressed. Importantly, the deeper impact of this on Indigenous people's thought processes and identity is also expressed. The response to this is to create a curriculum based not only on Indigenous worldviews but also, specifically, driven by the lived experiences of Māori people in this locality. In other words, a curriculum based on an ontic epistemic relation and a subjective social relation is desired.

The school as an institution prioritizes the personal development of each unique child located in a Māori reality. The collection of unique and very different people who make up the school community is bound together by a common understanding of tikanga, Māori language, and Iwi identity. Tikanga provides a central common grounding that is the basis on which individual development is made. The following two comments, the first by the principal and the second by a senior teacher, express this aspect of the school:

> Tikanga is about meeting each person's physical and spiritual needs... that's really what Maslow's hierarchy of needs is about as well... when a person's needs are met, they have everything they need to become who they are, and they will be able to do anything they want.

> Rather than preparing our children for university and conventional careers, we should be preparing them to exist in the world as unique people defined in their own ways... it's not about economics even, or about preparing students so that they can bring skills back for the Iwi, like becoming doctors or accountants... it's about students being their own unique selves in the world.

Interpretation:

These quotes all circulate around an emerging conception of education in this Māori school based on being Māori and engaging in/with the contemporary world as unique beings. This integration of collectivity (being Māori, being Iwi) and individuality (flourishing as a unique being embedded in the world) is expressed in the more formal terms of this research as the overall legitimation of people based on a subjective social relation and an ontic epistemic relation.

Teachers and students responded in a variety of ways in mathematics lessons. The following sections focus on three mathematics classes and the teachers Te Ara, Te Mana, and Te Ao.

Classroom 1, Teacher: Te Ara

Te Ara organized very structured lessons that adhered very closely to official curriculum resources and engaged students in learning the standard procedures, strategies, and algorithms required to solve problems. In many ways, Te Ara embodies a strong version of the standard curriculum mathematics discourse.

Te Ara expresses a high level of anxiety about mathematics achievement data. Major concerns center on the lack of adequate achievement data and a lack of consistency between different teachers. Te Ara comments:

> The school hasn't given me any information about the children I am teaching. I have no knowledge or where the children in the class are at in mathematics. I think things would be so much easier for everyone if we all follow the same journey and use the same assessments. We will all know then where we are in the curriculum and what we should be doing next.

For Te Ara, curriculum mathematics knowledge is essential for survival in the modern world and is a fundamental aspect of the happiness of the child. If the school does not prioritize mathematics in favor of developing children in a holistic sense, problems will arise. This is associated with the ubiquitous nature of mathematics as an inherent part of everything, especially the well-being of children.

> Mathematics is important because it is all around us… and I have seen a lot of children who lack confidence and have felt they are dumb and have hidden and shied away from mathematics because they don't want to other people to see that. Outside the gate, there are numbers all around us. Children have to be competent to deal with the numbers they will meet in their lives. There is nothing wrong with building the child's wairua (spirit), but the reality is that mathematics is in everything… this building has to do with numbers… the school runs on mathematics really, I think.

For Te Ara, mathematics has its own protocols and culture that must be learned if students are to find a place in the economic system outside of a Māori context and, more importantly, be able to understand the world, which is inherently mathematical.

> The children at my last school were happy in mathematics because... in a psychological sense... they were strengthening their minds, and this strengthens their spirit… because they have overcome a challenge, and this is a good thing no matter what the challenge; to overcome it strengthens the spirit.

Mathematics is construed as having fundamental connections to the material world and human life. Mathematics is necessary for understanding and being able to participate in the modern world. Te Ara expands the importance of mathematics, which is the same as English-medium curriculum mathematics, from being about numbers to being about "the ability of people to speak and to understand the world." It is a form of knowledge that underpins the nature of being human itself.

Students in Te Ara's class are for the most part happy because they can follow the procedures laid out for them to follow. Te Ara has a very definite set of behavioral rules. Students are strongly controlled to adopt a quiet, thoughtful approach and pay careful attention to correct procedures and language use. A common practice is for individual students to stand up in front the class and explain how they solved a problem using correct mathematical terms and symbols.

Students occasionally experienced distress when they were unable to follow a procedure. When this happened, Te Ara momentarily relaxed the usual behavioral rules and defaulted to ways of speaking and interacting that were aligned with the school ethos; students' well-being and personhood were prioritized.

Interpretation:

Te Ara represents a very formal approach to mathematics education. Legitimation is very much about mastery of the techniques, language, and symbolic representations of the curriculum version of mathematics coupled with "proper" behavior and participation in public displays of mathematical performance.

There is much tension between this approach and that of the school ethos expressed in a variety of ways, but all centered on Te Ara's focus on the importance of mathematical competencies to life in a capitalist economic system and the urban context. In the perspective underpinning practices in this classroom, without mathematics, students are not only destined for poverty but also an inability to understand the world, which is conceived as inherently mathematical. This tension peaks and is resolved when students show distress, which allows the school ethos to reassert itself in Te Ara's mathematics classroom.

The dominant form of legitimation here is based strongly on a discursive epistemic relation (the engagement with mathematics mediated by the official discourse of curriculum mathematics education) and an interactive social relation (based on explicit formal rules of behavior/performance). In this class, being Māori, being unique, only resurfaces in times of distress.

Classroom 2, Teacher: Te Mana

Te Mana prioritizes real world skills that are needed to operate in the wider world. This usually means handling money and everyday activities like cooking and fishing.

The usual practices and lessons are thought of in terms of pedagogical technique and mathematics knowledge acquisition. Te Mana mentions adjusting practices sometimes if the students are unsettled but otherwise there is a consistent sharp focus on mathematics learning and ensuring that students "stick to the point."

Te Mana indicates a strong influence from English-medium mathematics education. Lessons focus strongly on what the teacher needs to do for students to "achieve the highest levels." At the same time, there is an awareness of a potential injustice that lies within the universal status of mathematics. Te Mana had this to say on the matter:

> I haven't thought about who wrote the curriculum and other resources in Māori.... no doubt they are just translations of the English versions... it seems like assimilation... being pressured so that our ways of organizing things and thinking about things are just the same as Pākehā [European New Zealanders]... we don't want that.

The tension Te Mana feels here is strong; Te Mana would rather reject these imposed practices in favor of developing unique, Iwi (tribal)-specific mathematics practices and language. This is desirable, but it may contradict a need to be able to measure progress of students' learning and the need to "know whether you are at the national average."

The strength of this contradiction, which Te Mana calls a "weird situation," is summarized so: "we try and think mathematics and we don't relate it to the actual way we are." Te Mana thinks that her own consciousness is changed when teaching mathematics in part because you "have to think like this (mathematically)" and "you can't do what you want."

Te Mana is conflicted in several ways about mathematics and how it is learned. In terms of making progress through the levels of the curriculum, Te Mana professes impatience at not being able to "hurry up and finish tasks" but at the same time recognizes the need for patience and time to allow students to develop deeper understandings. For Te Mana, there is a strong tension between meeting targets and meaningful learning. Te Mana predominantly uses standard curriculum problems but sometimes attempts integrated work, which she believes will "increase the creativity." However, Te Mana comments:

> When we do the integrated work, we sort of lose sight of the mathematics that we are supposed to be learning. It's hard to tell what the children are learning sometimes, and they might go off and do all kinds of things... good things... but not mathematical. It doesn't feel like mathematics anymore.

Te Mana comments that the overall purpose of the school is to produce a kind of person primarily defined in terms of personal human attributes. Such a person is,

> ...a type of Māori person: a gentle person, caring, open to all kinds of learning, with humility... so we should be producing a sort of person who in the first place will be following their gifts and enthusiasms and that makes them all different but at the same time they will all be the same in other personal qualities, like caring, hospitality, openness, respecting others.

Apart from a potential place in following their gifts and enthusiasms, Te Mana does not regard mathematics knowledge or any other kind of knowledge to be essential, but people should be open to all kinds of learning.

Te Mana has a number of critical insights that appear to undermine a commitment to the way mathematics is being done. For example, the performance of mathematics merely to show that you have mastered what is expected (i.e., "doing mathematics to show you have done mathematics") is rejected. Te Mana also contends that there is a destruction of the unique cultural understandings in traditional activities when they are treated as mathematics exercises. Te Mana explains how students examined number patterns in tukutuku panels (traditional geometric designs that express cultural understandings). Here it was realized that the cultural purpose of doing tukutuku had been lost. Te Mana commented further:

> I'd like to get them to make a real tukutuku, an authentic one… I should ask Nanny P (a Māori elder)... not just do nice mathematics patterns as if they were tukutuku.

In a similar way, Te Mana finds the notion of standardized assessment extremely problematic because of the idea that "a child should show predefined attainments at a certain age when the curriculum doesn't have any idea about the child and the world they live in. This is a real affront to the child."

Interpretation:

The mathematics classroom of Te Mana represents an "intermediate" position. The approach is similar to that of Te Ara, but there are many points at which tension is felt in a variety of ways. Te Mana has a growing sense of unease with the curriculum version of mathematics education, which is enacted and expresses a number of important insights. Te Mana recognizes how the curriculum prioritizes tasks, work completion, and progress through the levels of the curriculum and how this works against a natural acquisition of knowledge appropriate for each child. Te Mana conceptualizes curriculum mathematics education as a form of assimilation or colonization, which is eloquently expressed in epistemological and ontological terms as "being pressured so that our ways of organizing things and thinking about things" are changed.

Te Mana also notices how seeing things in mathematical ways can erase the original, authentic Māori meanings of cultural artefacts and practices. This connects with the discourse of power that surrounds mathematics—somehow it is allowed to explain everything in the world in mathematical terms and make everything inherently mathematical.

Although Te Mana's mathematics classroom shows strong legitimation based on a discursive epistemic relation and interactive epistemic relation in a similar way to that of Te Ara, there is a simmering discontent that is a precursor to a shift in practice in which legitimation is more aligned with that of the school ethos.

Classroom 3, Teacher: Te Ao

Te Ao is a young teacher who has been teaching at the school for four years. Te Ao is the only teacher who has been exclusively educated in kohanga reo (Māori language preschool) and Māori schools; all other teachers were educated in English-medium schools and made the switch to the Māori school after teacher training.

Te Ao's current view of mathematics focusses on informal knowledge useful in the world outside of the school. This includes providing tools that support, for example, dealing with finances and managing time. Te Ao prioritizes work that is relevant to things that will benefit students outside of the school.

Te Ao expresses a belief in the universality of the basis of mathematics across languages and cultures. Mathematics has a common basis for all people in the world. For Te Ao, this derives from universal needs that cause all people to develop practices such as navigating, cultivation and gathering of food, and creating shelter.

Te Ao asserts that in modern times, mathematics has become similar all over the world because of national school systems. Te Ao suggests that before such systems, mathematical knowledge was more varied and dependent on context, language, and culture.

Te Ao picks the parts of the curriculum that are most relevant for students. Informal types of mathematics are associated with traditional cultural activities, such as rāranga (flax weaving), providing food for visitors, building canoes, and navigating by the stars. These activities are based largely on estimating measurements and the testing out of ideas through direct experimentation. This informality is

contrasted with mathematics resources that are regarded as formal and in need of contextualizing.

Te Ao locates being Māori when learning mathematics in the nature of pedagogy. According to Te Ao, "the way you approach mathematics, that is the most important thing." For Te Ao, there is no Māori thinking in the curriculum resources themselves; rather, it is in the way the teacher works and relates to students:

> I quite like having the curriculum documents around… it's good to know the assessment levels, but for me, it is always better to try to gauge the student's achievements directly by what they are doing, materially, in front of me right then and there by listening to them and seeing what they are doing when we are working together.

The construal of mathematics is strongly influenced by Te Ao's own nature and the knowledge of students in the class, many of whom are related:

> I am a new teacher, but I have a lot of experience from other areas, and I know the students well because I am related to many of them. I use the curriculum resources sometimes, parts of them anyway, but I mostly rely on my own knowledge and my experience and what is working with the students.

For Te Ao, the benefits for students from learning mathematics are an ability to be successful in the world based on a strong sense of Māori identity derived from genealogy. In this view, it is essential that students,

> know who they are and have a strong sense of identity… it is important that they have all the necessary elements in place so that they are whole and know the structure of a person… their identity and origins. If this is all in place, students will be settled inside... if identity is good, the journey in life will be good as well.

For Te Ao, a major benefit of a Māori education is that students know their identity and their whakapapa (descent, genealogical origins). Te Ao interprets the social and spiritual well-being, the happiness of students, as a sign of the strong grounding of identity and extends this to be a sign that the foundational philosophical principles of the school are being enacted successfully. There is a location of success in the student-teacher relationship with reciprocal notions of give and take; respect must be given to be received. In this way, explicit links are made to the philosophical principles of the school in the mathematics learning. This justifies a particular view of learning as being primarily about relationship, identity, positive participation, and reciprocity.

The activities designed by Te Ao usually involve physical movement or real material objects and are often unique, having been designed specifically for the particular lesson and students involved. There is no routine structure in Te Ao's lessons; instead, students engage in a series of activities that may or may not relate to each

other in terms of mathematics learning. Mathematics learning is another context in which the identity of students can be realized; the development of identity is the theme that relates different mathematics activities and gives coherence to them over time.

A genuine, strongly felt tension between Te Ao's mathematics practices and those of other teachers is felt. There is a vulnerability to criticism from other teachers and parents, and Te Ao expresses a need to be careful because being "too far out of the box is dangerous." This may arise because such people cannot recognise that mathematics is happening in Te Ao's lessons. In Te Ao's view,

> …other teachers are trying to be the ideal mathematics teacher, use the curriculum resources and get the students to do what is expected… this makes it all predictable, boring, and routine. I just go on my own thinking and what I can see is the most useful for my students. People might look at my lessons and see the students yelling, excited and moving around, standing on chairs maybe in some kind of game, and they think there's no mathematics going on… but it's there, mathematics is happening, but you just have to look carefully… it might not be what you are used to seeing.

Because of this tension and perceived risk, Te Ao organizes a small part of each lesson in which bookwork or worksheets are done to show to others that "real mathematics is being done."

In all of the lessons in the data, students and Te Ao are highly collaborative, physically active, very vocal, and socially interactive. Te Ao does not maintain a separation from students and often participates in the activities as well. A sign of the success in Te Ao's lessons is when students "come out of your class with a smile and are still keen on your lessons."

Te Ao does not attend strongly to how students are acquiring mathematics knowledge other than through participation in game-like activities. Learning is assumed to happen spontaneously as a natural result of participation in activities. Learning should be in context and have a real purpose. This involves integrating many learning areas in one activity.

Along with a focus on the practical and the integrated task, Te Ao elaborates the view that formal resources are not focused on the kind of math required in everyday life. Te Ao relies instead on personal thinking and resources.

In all the lessons in the data, there is no emphasis given to the learning of the newly invented Māori words for the mathematics curriculum. Te Ao assumes that the students' language proficiencies are such that that they will learn any new terminology required. Te Ao asserts that "it's up to each school to use their own words for mathematics; this is no big problem."

Interpretation:

Te Ao's mathematics classroom represents a regime closely aligned with the school ethos and is based on strong ontic epistemic and subjective social relations. Behavior and interaction between students and teacher are based on family-like relationships in which students and teachers interchange roles frequently and knowledge is generated largely through direct engagement and experience of unique activities. Students behave in many different ways in activities that require direct involvement and engagement (often physical). Mathematics learning is implicit to these activities, which has an overall purpose of supporting the identity development of each student as an individual and as Māori. In this perspective, mathematics education is another context in which students may come to know themselves as unique and as Māori. The legitimation is based on a strong ontic epistemic relation and subjective social relation in the ways understood in the school ethos—participatory epistemology and the person as a unique, Māori being.
This case also highlights how tensions with curriculum mathematics education manifest with this form of legitimation. Te Ao feels forced to include curriculum resources and demand certain behaviors from students (the reintroduction of a legitimation based on discursive epistemic and interactive social relations) for political reasons—to show other teachers and parents that this form of mathematics education is happening.

Student Perspectives

Students tended to hold views that aligned with those of the teachers who taught them. For most students, mathematics was definitely about the mind and "sharpening the brain" so that mathematics activities, primarily "working out answers," could be done quickly and efficiently. Quickness is associated with sharpness of mind. Students attribute the importance of mathematics to having essential skills in order to "succeed in a career or get a good career." One student commented,

> If you want to have a good job, you need mathematics so that you will achieve in the world. Mathematics will make you sharp... like on a scale of one to ten, you will get a ten. In all activities you have to use mathematics. Like in rugby, you have to count the points, and in your career… you will need lots of subjects like English, Māori... and brainy people will do science and mathematics.

When asked about who real mathematicians were and what they were like, there was a very strong assertion that mathematicians would be male, European or Asian. and probably "geeky loners" with poor social skills. It was apparent to students that Māori people weren't mathematicians.

Students tended to make somewhat circular arguments about the importance of mathematics, as these researcher-student interactions show:

> Mahia (student): You will need mathematics in your career.
> Researcher: To do what?
> Mahia: To do the mathematics that is needed.

> Ānaru (student): Mathematics will make your brain sharp
> Researcher: Sharp in what sort of ways?
> Ānaru: So that you can be good at games.
> Researcher: What sort of games?
> Ānaru: Oh... mathematics games... like cool math games

> Researcher: How will mathematics help you when you are older?
> Tuki (student): It will be very useful.
> Researcher: In what ways?
> Tuki: I'll be able to help my own children with the math they have to learn at school.

Commenting about mathematics work, one student offered the opinion that it wasn't real math because there was "too much discussing and drawing pictures." Another student associated learning lots of mathematics strategies for calculating correct answers with an ability to "decide which pathway in your life is the good one."

Students have a clear appreciation of mathematics as a challenge to the mind. Without a challenge, there "could be no learning," and through challenge, "correct mathematics learning" could be achieved.

In contrast to this view of mathematics, a senior student, who had decided not to continue with mathematics learning in the senior school, explained that learning cultural knowledge from elders who, perhaps, would soon be lost was more important:

> I can pick mathematics up any time when I need it and know that it won't be a struggle... that's why I am knocking it out [not doing it anymore]... so I can concentrate on te reo Māori [Māori language] and doing kapa haka [Māori performing arts] where I can express myself... and I am going to learn about my marae [tribal settlement and people] from my Koro and Kuia [elders]... they won't be around for very much longer, and I want to learn from them.

Interpretation:

Students generally have an instrumentalized view of mathematics education as something necessary for employment and necessary for participation in the education system itself. No students made strong links between their experiences in mathematics and being Māori. Societal discourses about the importance and power of mathematics and who does mathematics (brainy people, non-Māori) were surprisingly strong given the fact that almost all students had been brought up from early childhood in Māori schools and preschool centers. At the same time, students believed that they could learn mathematics but had an ambivalent attitude towards it; it was necessary and important for employment and careers but could be picked up as and when needed.

In terms of specialization, students present a variegated picture. There are elements that can be interpreted as aligning with the discursive epistemic and interactive social relations of curriculum mathematics and somewhat contradictory elements that align with the school ethos. There may be some evidence that students are moving to a position that centralizes their own Indigenous identity, language, and culture, which then allows them to operate strongly in social fields that do not legitimate these. Curriculum mathematics certainly seemed to cause less angst for students than for their teachers.

Conclusion

The findings just presented and discussed paint a complex and nuanced picture of life in this Māori school. At a high level of generality, and in the formal terms of the analytical concepts of legitimation, the school as a whole bases its practices on an ontic epistemic relation and a subjective social relation. In curriculum mathematics classes, on the other hand, legitimation involves a discursive epistemic relation and an interactive social relation. The former centralizes being Māori and having a direct, participatory engagement with real events and the world in general. The latter centralizes being a mathematics student who has knowledge of the official mathematics education discourse.

There are strong indications in the data about the desire to create a mathematics curriculum, and a full school curriculum in general, that is consistent with the legitimation prioritized in the school ethos. According to the analysis in this research, this is a mathematics curriculum based on an ontic epistemic relation and a subjective social relation (as understood in this Indigenous context). It is here that a return is made to the ethical stance described earlier with respect to non-Indigenous researchers working in Indigenous contexts. At this point, it is very tempting to launch into a discussion of what is entailed in the creation of such a curriculum and to list recommendations. Despite the generation of new knowledge that has taken place in this project, no recommendations can be made. In the spirit of ethical care for the other, in the sense of Levinas, all that is possible is the unconditional offering of these findings with the understanding that they are possibilities or even a fantasy.

Recommendations, if any are to be made at all, are entirely an internal matter for Māori schools and communities themselves, as are the following concluding comments.

Firstly, it seems likely that schools that may wish to embark on an exploration of mathematics education in a new paradigm will have to meet the challenge posed by the strong connection between mathematics attainment and success in urban, capitalist conditions. Curriculum mathematics education plays a powerful role, if not a central role, in the creation of subjectivities aligned with neo-liberal social ontologies now deeply embedded in New Zealand society. The identity formatting effect of mathematics education and complicity in the production of neo-liberal subjectivities is well documented in the critical mathematics education literature (see, for example, Pais & Valero, 2012; Popkewitz, 2002; Skovsmose, 1994; Valero, 2018). Encouragement can be garnered, however, from the phenomenon of Māori resistance in urban conditions in general. As discussed earlier, Māori have already successfully maintained cultural integrity whilst adapting to and adapting urban/capitalist conditions with respect to a number of domains of activity, which taken together might be thought of as a Māori economy. If this wider view is taken, the creation of an ontic- and subjective-based mathematics education might gradually be aligned with this Māori economy rather than the existing mainstream economy. This accepts that education in general and mathematics education in particular is always prefigured by the nation's economy; it seems plausible then that as the Māori economy (itself based on its own ontological commitments) grows in strength, Māori mathematics education may be pulled into its orbit.

A second important and related challenge concerns the "gaze" of mathematics education, which Dowling (1998) has labelled the *myth of reference*. In this gaze, mathematics education redescribes the contents of non-mathematical domains of all kinds in its own terms, recasting the whole world, in effect, as inherently mathematical in nature. As Te Mana recognizes clearly, there is a very significant problem when curriculum mathematics education casts its powerful gaze upon Indigenous artefacts, practices, and the public and personal lives of Indigenous people; in an uncritical engagement with curriculum mathematics education, and uncritical acceptance of its discursive epistemic relation, a cultural and historical revisionism, a form of symbolic violence, can result. This suggests that a form of perspective management might be employed in which the cultural origins and meanings (the ontologies and epistemologies) that underpin and create the artefacts and practices of Māori life are protected from being redefined by this mathematical gaze.

To do this, a critical awareness and careful distinction can be made between the mathematical perspective, which sees things in a mathematical way, and the authentic meanings inherent in Indigenous artefacts and practices. In other words, we can understand that a mathematical gaze is possible of any entity but that the mathematical understanding generated is not the entity itself. The entity retains its own

ontological integrity, which may have nothing to do with mathematics. Being explicit about both perspectives and when switches are made between them is necessary in order to avoid the very common assertion that an Indigenous practice is "really" a mathematical one even when the participants themselves have no cognizance of any mathematics being enacted.

There is a strong resonance here with the critique of culturally relevant and responsive pedagogical practices as *asset-based pedagogies* made by Django Paris and H. Samy Alim (Paris & Alim, 2014). These two authors build on the foundations laid by the earlier developments of culturally relevant and culturally responsive pedagogies (e.g., Ladson-Billings, 1995a, 1995b, 1997) to promote Culturally Sustaining Pedagogy (CSP) as a critical centering of the ways of being of Indigenous communities and communities of color. CSP should operate to automatically involve a disruption of dominant education systems that only legitimate "White, middle-class, monolingual, cisheteropatriarchal, able-bodied superiority" (Alim & Paris, 2017, p. 13). Paris and Alim critique asset-based approaches, such as funds of knowledge, culturally relevant/responsive pedagogies, and third space, as too easily defaulting in practice, if not in theory, to an instrumental usage of Indigenous practices, language, and, indeed, Indigenous bodies for the purposes of achieving success defined in terms of a panoptic *White gaze*. Here, the connection with Dowling's myth of reference and the mathematical gaze so keenly felt by Te Mana becomes clear; we can understand the recontextualizing gaze of curriculum mathematics education as part of the panoptic White gaze—Indigenous Māori artefacts and practices are repurposed as assets to bring students into the legitimation regimes of curriculum mathematics education. Paris and Alim provide vital insights by recognizing the tendency of asset pedagogies to work on static, "archaic," and reified forms of Indigenous cultural practice, knowledge, and identities and neglect contemporary and emergent forms forged in urban, capitalist conditions such as those emerging in the Māori school of this study. In the New Zealand context, this manifests clearly as a persistent focus on traditional Māori contexts and practices, such as flax weaving, ocean navigation, carving, and hāngi (traditional earth ovens). Contemporary (urban) realities for Māori communities are rarely present, and if they are, they tend to be indistinguishable from "Whitestream" activities apart from being translated into the Māori language, involving brown bodies, and with only their mathematical aspects emphasized.

Paris and Alim (2014) also describe the necessity of developing an *inward gaze*, which critically addresses both the liberatory aspects of contemporary Indigenous culture, language, and practices, and the restrictive. For the participants in this study, there was considerable critical reflection on their existing mathematics practices, the effects on identity, language, and Māori knowledge, as well as the benefits of coming to know mathematics. For the researcher, the inward gaze is a constant critical reflection on his own position, the impact of his words, and the limits of what he can say and know, which has led to his position of ethical knowing and not-knowing.

In a further development of CSP, McCarty and Lee (2014) developed the concept of Culturally Sustaining/Revitalizing Pedagogy (CSRP), specifically in Indigenous contexts where Indigenous sovereignty is a fundamental issue. McCarty and Lee's work resonates strongly with the situation in the Māori school of this study. Indeed, the desire to create a curriculum centering on Māori ontology and epistemology is an expression of Māori sovereignty, and the process that the Māori school is going through may be thought of as an example of critical CSRP. There is, it seems, a significant difference here in New Zealand. The current strengthening position of Māori in our small country is creating the possibility at least that rather than Indigenous educational sovereignty being thought of as accountability to Indigenous communities in the same way as to the national government, that education itself may eventually come directly under this Indigenous sovereignty. Despite the homogenizing cosmopolitanism and "melting pot discourses" prevalent in capitalist, urban conditions, Māori in general, and this Māori school in particular, are showing that a pluralistic society in which communities co-exist with deep level ontological differences is possible and necessary.

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