

IT'S ALL A MATTER OF PERSPECTIVE

KATHLEEN NOLAN, LISA LUNNEY BORDEN

It is no secret that inequity is pervasive in mathematics education. Rather than being welcoming spaces for learning, mathematics classrooms continue to be sites of dehumanising experiences (Martin, 2019) for far too many students. Research scholars in the field of mathematics education recognise that colonialism (Lunney Borden, 2021) and white supremacy (Stinson, 2017) continue to alienate and exclude many students. Mathematics educators have recognised and attempted to respond to these challenges, with moves toward greater equity coming in many forms—critical mathematics education, social justice mathematics, culturally responsive/relevant/relational/sustaining pedagogy, Indigenous and decolonising pedagogies, and so on—yet evidence suggests that most attempts at equity reforms have had little impact (Martin, 2019). The tinkering has not been enough to create transformation; and we wonder what a truly transformative, and perhaps more disruptive approach, might look like. We believe a move toward such a disruptive pedagogy begins first with understanding how researchers are currently engaging in this work. To this end, we have engaged other mathematics education scholars [1] in conversations, toward an understanding of the ways in which we describe the work that seeks to disrupt mathematics education as is.

We (Kathy and Lisa) are mathematics educators who care deeply about these issues and are committed in our work of supporting educators as they think through the complexities of disrupting the status quo practices of mathematics education. We recognise and draw from many interconnected fields in our work (for example, culturally responsive pedagogy, Indigenous education, critical mathematics education, ethnomathematics, *etc.*) and often grapple with the various ways of describing this work in the mathematics education field. As instructors of mathematics education courses on equity and culturally responsive pedagogies at our respective universities, we both recognise the importance of using these courses to challenge and disrupt the mathematical experiences of our students (prospective and practicing teachers), so that they too can work to disrupt and decolonise dominant practices in their mathematics classrooms. This article is part of our journey to explore these varied and interconnected terms/fields and to come to a more nuanced understanding of how they interact so that we (and others) might act within our research and our classrooms with a clear aim to disrupt.

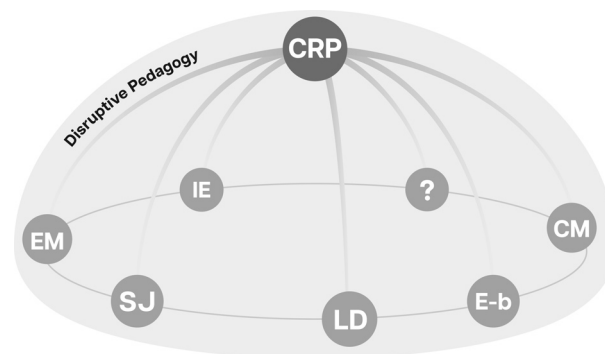
Framing

We both teach courses which have a clear and deliberate focus on the issues introduced above. Though named and conceptualised somewhat differently, the courses we teach are premised on the belief that dominant mathematics needs to be disrupted/decolonised through critical and culturally

responsive approaches to engaging with students, prospective teachers and practicing teachers. We draw our course content from research focusing on many different areas (or sub-fields) of mathematics education—culturally responsive pedagogy (CRP), Indigenous education (IE), equity-based research (E-b), critical mathematics (CM), ethnomathematics (EM), social justice (SJ), language diversity (LD), decolonizing perspectives, and Indigenous and Africentric ways of knowing, being and doing. We are continually reorganising and reconceptualising our courses as we continue to strive for the right balance that will help our students create more inclusive and equity-focused spaces in their own mathematics classrooms.

Kathy's course (entitled, 'Culturally Responsive Pedagogy in the Mathematics Classroom') is structured around the idea that the many intersecting areas of research named above (EM, CM, IE, SJ, LD, E-b) shape CRP (Nolan, 2020). In other words, CRP could be considered the umbrella term, with research in each of these areas (or sub-fields) serving to shape and inform one's understanding and practice of CRP. The 3-dimensional model below (Figure 1) illustrates that conceptualisation she uses for her course.

These areas are introduced to students in the course by providing example readings (scholarly research texts) for each area, giving students an opportunity to gain a sense of the richness of the field of CRP. For example, SJ is introduced in the words of Bartell (2013) as when "mathematics is used to teach and learn about issues of social injustice and to support arguments and actions aimed at promoting equitable change" (p. 130). In a similar manner, E-b research is described as that which considers students' linguistic, ethnic, racial, gender, and socioeconomic backgrounds in learning



CRP - Culturally Responsive Pedagogy, EM - Ethnomathematics, CM - Critical Mathematics, IE - Indigenous Education, SJ - Social Justice, LD - Language Diversity, E-b - Equity-based, ? - Other

Figure 1. General Research Perspective.

mathematics while “challenging the hegemony of mainstream knowledge and the reproduction of inequality” (Meany, Trinick & Fairhall, 2013, p. 261). Assignments in the course required students to read more widely and deeply in each of these areas.

In each of the three offerings of the course, Kathy noticed that students grappled with ideas around how to categorise and label the different research texts being read and discussed in class. This noticing highlighted the complex nature of drawing lines between these areas of research when there are obvious intersections and overlaps among them—and led to Kathy’s desire to dig deeper into the research on these sub-fields. Thus, Kathy, together with Lisa, invited a number of mathematics education scholars to participate in an interview where we asked how they would describe/position their research with/in these given sub-fields. In the interviews, we set the context for our questions using the same conceptualisation of CRP and the sub-fields as was used in Kathy’s course (Figure 1).

Emerging from our own research and experience with the literature, we constructed an extensive list of approximately 60 mathematics education scholars who we initially identified as engaging in research associated with CRP and/or one of the relevant sub-fields. To keep the scope manageable, 30 of these scholars were invited to be interviewed, with 21 agreeing. The mathematics education scholars who participated came from various countries; for example, Canada, United States, Brazil, New Zealand, Australia, Malawi and Greece.

In the interviews, we began by describing Kathy’s conceptualisation of CRP (as used in her course). We then posed a number of questions to the scholars about their own research theories and practices, as well as their views on this conceptualisation of CRP. Here, we limit our discussion to the first interview question:

1. (a) If you had to select one keyword (to describe a field of research) from the list of ethnomathematics (EM), critical mathematics (CM), Indigenous education (IE), social justice (SJ), language diversity (LD), and equity-based (E-b) research to describe where you position your work, which would it be? Explain.

(b) Which of the above-named fields/words would you be least likely to select in positioning your scholarly work?

In our desire to explore how the field of CRP and its connected sub-fields is constructed/shaped in and through mathematics education research, we sought to understand how researchers/scholars situate, or position their research. From positioning theory, we believe that teacher and student identities are constructed through networks of control, authority and power (Wagner & Herbel-Eisenmann, 2014). We propose that, in a similar manner, the field of CRP research is constructed through the ongoing interactions between researchers/scholars and mathematics classrooms, mathematics curriculum, teacher professional development, *etc.* In other words, how scholars position or describe their research—the labels they do and do not draw on—shapes the overall field and how the rest of the educational world (schools, teachers, students) receives it.

Similar to Foote and Bartell (2011), we recognise that “researchers themselves exist within socio-cultural, political and historical contexts” (p. 46) and that these contexts and lived experiences shape how they engage in the research they do. As Darragh (2016) notes, considering identity as action can be useful as “we perform our selves—be it by telling stories, joining groups, acting in a particular way at a particular time, positioning ourselves and others within wider societal discourses” (p. 29). As researchers, we were interested in hearing the stories other researchers tell about their work and how these researcher identities have been shaped by lived experiences. Our reading and discussing of the transcripts led us to notice several themes that, for us, synthesised how participants described and positioned their research.

Noticings

Below, we point to the different themes or ‘noticings’ which summarise the ways scholars described their research and/or the sub-fields in the interview transcripts. We refer to these noticings as ‘ways of describing’ and focus on six: All or nothing; It depends; The verbs used; Insider-outsider perspectives; An umbrella as a hierarchy; Too big or too small. We developed these categories for ‘ways of describing’ by individually reading transcripts and coding emerging themes. We then discussed our themes together to come to a shared understanding of these categories. In the presentation of the results below, we make an effort not to apply a heavy hand of interpretation to the data, but instead to let the scholars’ voices stand on their own. Our key interpretive act for this article has been discerning the categories or themes based on our analysis of the interviews; beyond that, we think the reader has more to learn and reflect on by letting the scholars speak for themselves.

All or nothing

In this first theme, we share how scholars grappled with positioning their work given the set of six sub-fields. The scholars’ ways of describing in the interviews ranged from selecting *all* of the terms to selecting *none* of the terms. For example, Gale noted that her CRP scholarly work “actually has touch points in all of the areas”, and similarly Sonya shared the difficulty of “align[ing] with just one of them because I am a little bit all over the place”. Similarly, both Lisa and Bernice spoke about doing “bits and pieces” and “dabbling” in all of them.

Positioned at the other end of the spectrum from seeing all of the six sub-fields in their work, Betty shared, “I don’t see my work in *any* of these fields. I don’t label my work in any of these fields”. A reluctance or inability to label was shared by others as well. For instance, Dave commented, “I would say that I don’t see clean lines between them”. Margaret stated, I’m intrigued by the question, because they all come together to me, it’s not that one or the other”. Following along this line of thought about the sub-fields all coming together, Cynthia described her positioning as “an intersectionality of them threaded across some more than others” and that, in reality, “there’s this morphing between one field to the other, which I think is very good, I don’t think we have

[...] solid boundaries and that we *should* have these blurry boundaries between these fields”.

These metaphors of ‘morphing’, ‘blurring’, and ‘intersectionality’ help describe the recurring theme or way of seeing these sub-fields as more fluid, void of solid or clean boundaries between them. In some cases, scholars not only emphasised the fluidity of movement between, but the intertwined relationship:

You see [...] how ethnomathematics, Indigenous education, social justice education, language [...] learning about language diversity, and definitely equity-based research are intertwined. They’re intrinsically intertwined. And one cannot do one [...] like ethnomathematics without thinking about social justice. Or you cannot do Indigenous education without thinking about the language diversity or equity issues. (Margaret)

Dave shared a similar view about the relationship between ethnomathematics and critical mathematics education: “We see them as being very closely related. And in fact, if you’re doing critical mathematics education properly there should be ethnomathematics and if you’re doing ethnomathematics properly, it should be critical mathematics education”.

Even though some scholars attempted to ‘comply’ with our request to position their work by selecting a specific sub-field, a few scholars reached a point where the best they could offer was to describe their work by selecting/settling on three or four of them, not one. For example, Cynthia noted, “so I would put myself in critical math, Indigenous education, social justice, and place and land-based education”. Cris described a key relationship between three of the terms when she shared that she is “interested in language [diversity], but [...] as a tool of promoting equity-based research and social justice”.

As illustrated in Cynthia’s comment above, some scholars not only drew on the six labels provided to them but introduced additional terms which could be considered sub-fields that had been left out or neglected in this CRP conceptualisation. For Cynthia, place- and land-based education could be added; for Ruth, ethical relationality was key to her work and yet not captured in any of the six sub-fields presented. Bernice considered the possibility of adding anti-racist education: “I would say [...] anti-racist education has been a key explicit realm of research that’s really picking up [...] I mean they might put themselves in that umbrella of equity-based research, but it might also be its own category”. Gale offered, “I find it very hard to pin myself down in here because I find these boundaries very fluid and that [...] I think there are other [categories] that I would add to this”.

Important clarifications were also offered by scholars which, in some cases, allowed them to better position their work. For example, instead of social justice, Rico preferred to use “teaching mathematics for social justice” or, to be more specific, “reading and writing the world with mathematics”. Similarly, Ole made an important distinction with respect to the label of critical mathematics, advocating instead for the use of critical mathematics education; that is, he expressed interest in exploring a critical way of doing mathematics education not a critical way of doing mathematics. And Bernice, who described the various meanings that equity-based work can take on, saw her work as being

positioned as equity-based but added, “I take a very critical approach to that equity-based research but [...] it’s not quite the same as critical mathematics [...] I would say equity-based research, but with a really explicit focus on systems of privilege and oppression and how they operate”. This perspective was shared by Andrew, who described his work as both critical and equity-based.

To position their work, scholars often grappled with the *meaning* of the terms. For example, what does ‘social justice’ *mean*? According to Sonya, “social justice, which is for me, these days, the most vague one. It’s everywhere, and nowhere [...] I did label my research social justice earlier at one point, but I don’t anymore”.

It depends

The language of ‘it depends’ was frequently drawn on when scholars thoughtfully reflected on the various contexts that played a significant role in how they described/positioned their work. In many instances ‘it depends’ was about a location, people involved in the study, the time of the study, or even how the funding was allocated. For example, Ruth explained, “Well, I think for us too it depends on where our focus is for a particular project and who is involved in that particular project”.

Where the work takes place seems, for some, to influence how the work is described. Morgan noted “ethnomathematics is a lot to do with my work, with [colleagues] in [a location involving a large Indigenous population]”, but now, in a different context, there is “a long history with critical mathematics education”.

For some, the work has shifted over time and what was once labelled in one way has now shifted to something else. For example, Andrew stated, “I think the research that you know of mine is in critical math [...] I’ve kind of shifted directions a lot. So, [...] more equity based but still critical, but I wouldn’t locate in critical math anymore. I still draw on critical theory and things, but I’m looking more at who’s being recruited to teach math in schools in the US”.

Sometimes, the location of the work influences the way of describing it for reasons more rooted in practicality. For example, Steve noted, “I had to [...] consider what that might be in [...] a [province in Canada] context or just using the methodologies of critical race theory and decolonisation. [...] They overlap with a lot of these equity-based [...] it really does depend on how researchers and practitioners take up these things”. Anna noted that “when I came to Greece, I was very much involved in race and gender issues, because I was working with Romani children. So, I was thinking along [...] along issues of forbidden languages, hybrid identities, but also race and also gender”. Both *where* and *with whom* the work is being done influence how it is described. Or, even more pragmatic, Cris stated that a consideration for naming the work is funding: “I would label a lot of my work in Indigenous education, partly because that’s the category that is *funded* by my university”.

The context, people, places, and the work itself, also seemed relevant to Anna who stated,

I could say for example, that when I started my research as a PhD student, although I didn’t identify my

research as ethnomathematics, the fact that I was using an artifact, which was called running pelta, and it was a kind of an artifact that travelled through different cultures. You could see it in Greek culture, in Arabic culture, in the Cordoba Museum [...] so, it is an artifact that does not fit today in only one culture.

Rather, she described this work as “art-based mathematics” and explained that, at the time, ethnomathematics was not really practiced or even talked about in the UK. She followed up by noting, “if I was at that time in Brazil, probably I would have called my work ethnomathematics, but I was not in Brazil. I was in Britain”. She noted D’Ambrosio’s significant influence on the work in Brazil. Her explanation, along with the many other voices presented in this section, shows that the name, or label that one puts to ones work depends on many interconnected factors.

The verbs used

As a theme, we noted the different verbs that scholars drew upon when asked to position their work. Across the 21 interviews, scholars drew on many words/phrases to help position their work in terms of what they do, read, write, use, center, work in, have an interest in, think about, associate with, are concerned about, and are fond of. Consider the following few examples:

Anna indicates that, at one point in time, she “was reading ethnomathematics [...] [and] very fond of critical mathematics also”;

Sonya, Morgan, and Ruth all draw specifically on the expression ‘written about/in’ to describe their positioning with respect to the several areas;

Annie states that, even though she might not position her work in certain areas, she “can use literature from them”;

Cris offered that she is interested in IE and EM but adds, “I haven’t centered my work in them because of my own identity”;

Cynthia draws on “reading, writing and thinking about” to describe her positioning in areas most relevant to her research.

This focus on verbs can be seen to connect to the ‘it depends’ way of describing since some verbs appear to hold more or less overall value in relation to expertise. For example, across the interviews, a classification of verbs came through in the following order: *doing* research in the area, *writing* in the area, and then *reading* in the area. For instance, to ‘read’ in the area of ethnomathematics research does not appear to carry the same weight of positioning as ‘doing’ ethnomathematics research. In addition, some scholars clarified the difference between what they do in their research and what they do in their teaching. For example, with regard to language diversity, Bernice shared, “I don’t do much specifically with language diversity [...] I read a lot of that work, and I use a lot of that work in my teaching, but generally it’s not foregrounded in my research”. Similarly, Dave reported, “I’ve done some actual ethnomathematics,

but not very much. I do ethnomathematics with my students, but I haven’t written a lot about it”.

Insider-outsider perspectives

It was apparent from the interviews that some scholars found the second half of the question—sub-field labels they would be *least* likely to use to describe or position their work—more obvious/clear to them than their efforts to settle on a label that they would be *most* likely to draw on. For example, Rico was able to clearly articulate what he does not call his work:

CRP has, as I understand Gloria [Ladson-Billings]’ framing, three key points: academic success, cultural competence and critical socio-political consciousness. I do pay attention to cultural competence, but I don’t use curriculum of people’s home culture as part of the curriculum, which for me would fall more under [...] probably ethnomathematics, as I understand the contested field of ethnomathematics.

For Rico, Ladson-Billings’ worked framed what he considered necessary to call one’s work ‘CRP’.

Also, Andrew clearly stated that his work is “certainly not, [...] Indigenous education, I have no expertise”. Yet, for other scholars the category of Indigenous education was not so clear. We noticed the challenges confronting some scholars with regard to labelling their work as Indigenous education, given their own identification as non-Indigenous and therefore feeling as an outsider to/from Indigenous communities and knowledge systems.

Numerous scholars noted that *who* is involved in the project influences *how* it is labelled. This was particularly relevant when thinking about where and when to use Indigenous education. Annie stated “Indigenous education, for me means different things. Because Indigenous education [...] it’s not only the teaching and the learning, but it’s also the institution, and the population, the community itself”. Sonya explained that while she works with Indigenous populations, she was not calling it Indigenous education stating,

I’m in mathematics education and Indigenous people are part of my work. [...] it depends on how I understand Indigenous education, because I think that is something different to see [...] how we can apply mathematics education so it works well for Indigenous people too.

Elaine also separated herself from Indigenous education, explaining, “I’ve read a lot in Indigenous education but I haven’t really worked in those contexts”, and added that she is “struggling with the debates around whether cultural practices should be mathematised or not, and by whom”. Cynthia, on the other hand, who has spent decades working in Indigenous communities, felt that “equity-based, from the literature, focuses not as much on Indigenous education” even though, she added, “when we’re talking about decolonising our classrooms and thinking about Indigenous curriculum, we’re certainly thinking about issues of equity”. Edward, as an Indigenous scholar, clearly positioned himself in Indigenous education and stated that his goal is to begin there rather than starting with Western mathematics: “My

whole life's work really is trying to get inside that Indigenous perspective and see it from that direction".

For Edward, language is critical for this work, noting,

Language diversity is critical, absolutely critical because it's [...] it's associated with rebuilding our culture which has been impacted, of course, by residential schooling, but all kinds of impingement by you know, television, radio, all these things have caused problems with us propagating and transmitting our languages. So, language diversity, languages are a carrier of culture for me and if we're going to engage in true Indigenous education, I think, language diversity is a critical part of that.

Other scholars made similar connections between Indigenous education and language diversity or revitalisation. For example, Lisa, while identifying her work as being situated more in Indigenous education, noted that she "uses language as a lens to do Indigenous mathematics". Similarly, Cris noted how examining language diversity and mathematics has allowed her to bring together her interests in Indigenous languages, linguistics and mathematics. Morgan echoed that "so often it's language revitalisation, which is to do with equity" but added that "as a non-Indigenous person, there is huge responsibility for looking at your own role within that". Both Cris and Morgan explained they have a background in applied linguistics that supports this work.

An umbrella as a hierarchy

We noticed that some scholars struggled to position their work according to the conceptualisation of the fields and sub-fields primarily because they were not in agreement with CRP as the umbrella term. For example, Rico responded to this interview question by offering:

So, it's an interesting question because the hierarchy that you set up [...] I don't understand it in the same way [...] I do not think what I have done has been culturally relevant pedagogy, as I understand, mainly from Gloria Ladson Billing's work. So, if I don't do CRP then how can I claim to do critical mathematics and social justice mathematics, if you have this hierarchization, which puts them within CRP. So then, you know, I'm kind of stuck there, and I don't quite know how to answer the question.

While Rico advocated for no umbrella term at all, others sought to replace CRP as the umbrella. As scholars communicated their thinking about this question, several different possible umbrella labels were brought forth for consideration in a new, or revised conceptualisation. For instance, Margaret offered, "For me, critical mathematics is the big umbrella under which all these other things reside". The idea of using social justice (or social justice mathematics education) as the umbrella term was put forth by Sonya, Steve, and Morgan. In fact, Steve wrote that, in the literature review for his dissertation, he "spent a lot of time [...] teasing these things apart because the umbrella term seemed to be social justice math education". Straddling the options of both social justice and equity-based as possible umbrella terms, Dave offered, "I see social justice relating to all of

those, or them all being maybe in a larger group that would be called social justice [...] or, equity based". While Bernice also suggested equity-based research as a possible alternative umbrella, she presented an interesting connection between equity-based research and CRP in offering, "I think for me, CRP was my way into thinking about equity. And so, it works well for an umbrella term for me".

In drawing on the work of Ubiratan D'Ambrosio, Ole proposed that "every kind of mathematics is ethnomathematics", thus making a case for ethnomathematics as a possible umbrella for *these* sub-fields, and many more. Robin, who supported CRP in its umbrella role, shared a slightly different perspective, noting that she primarily uses the term culturally *sustaining* rather than *responsive*: "for culturally sustaining, what I think [is] it's got the edge of decolonisation and that edge of doing something about it, not just reflecting and being responsive to culture, but actually more action focused [...] culturally sustaining is asking for *more* of teachers, expecting more".

Too big or too small

The conversations around each of the sub-fields, and their intersections, were engaging and informative, but probably none more so than that around ethnomathematics. Ethnomathematics was viewed by many scholars as a contested field, partly because it is so slippery to define, and perhaps even more slippery to confine. As Cris stated, "I think that there are some really wide interpretations of what it means and what its purposes are". We noted this variety in how scholars spoke of ethnomathematics.

One common idea noted was the interpretation of ethnomathematics as being only relevant in an Indigenous context. Recalling Anna's wondering of whether working with Greek artefacts would be ethnomathematics, others also placed this label specifically in an Indigenous context. Robin expressed her thoughts, "I'm not Indigenous and so, if I was looking at particular activities—this is how I view ethnomathematics, to unpack the cultural activities in terms of mathematics—I don't think that that's my place to do so". Elaine echoed this concern for the place of non-Indigenous scholars to engage in Ethnomathematics:

I'm still like struggling with the debates around whether cultural practices should be mathematised or not, and by whom and all of that. So basically, as a white settler monolingual, I don't think I'm somebody who should be taking cultural practices and renaming them as ethnomathematics.

Edward clearly identified ethnomathematics as being "positioned more in what you might call Western mathematics. So, we start from Western mathematics and then we start looking out at other cultures. So, ethnomathematics comes at it from the wrong way, the wrong direction for me".

Cynthia also was troubled by this application of Western mathematics to Indigenous artefacts.

And it's really hard to engage in ethnomathematics without overlaying your own perspective of how we see the world mathematically on top of what is being practiced. So that idea of the unfreezing of the

mathematics that's inside basket weaving, or carpentry, or nursing, you know, being able to pull out what's mathematical about this. And it's only mathematical if we can sort of overlay this—what Bill Barton talks about as the nearly universal conventional way of thinking about it—if we see that in there, then we can label it as mathematics.

While troubling the term ethnomathematics, Cynthia also argued,

The strength of ethnomathematics is that it does put our gaze toward another way of thinking about what counts as mathematics, and what it means to be mathematical or to be good at mathematics, and who can do it and who can't and all the other challenges that frame some of the inequities that are occurring in doing mathematics and teaching it.

Ruth, working with Indigenous communities, embraced the term for that same reason while also recognising other ideas might come into play. She noted that “when we started, [our research] was definitely within the domain of ethnomathematics”, but over time it has changed:

We've also been looking a lot at this idea of ethical relationality as well. So that relationship piece has become at the forefront of a lot of the work that we've been doing. But in terms of the culturally responsive education piece, I would say that we're definitely within ethnomathematics [...] and we do have Indigenous education as part of it, but that would be a smaller part as well [...] we tend to classify our work as bringing together Indigenous knowledges and mathematical knowledge.

In Ruth's view, ethnomathematics is less about applying Western mathematics to Indigenous artefacts and more about bringing the two perspectives together.

Ole challenged the idea that ethnomathematics is only applicable in Indigenous contexts and explained that ethnomathematics is applicable in other cultural contexts as well but often is not taken up:

I have not seen much, if I've seen any studies, on academic mathematics and [how] it's an example of ethnomathematics. And there are studies of bank accountant's mathematics, engineering, business mathematics, but normally not as a branch of ethnomathematics. According to Ubiratan's [D'Ambrosio] definition, we are all dealing with ethnomathematics. But in the tradition of the published version of ethnomathematics, it is more what we *normally* think of as being ethnomathematics, not as Ubiratan's extended definition.

He further expressed his views that:

Ubiratan D'Ambrosio, in some ways, [his] writing has said *every* kind of mathematics is ethnomathematics. Because ethno refers to culture and [...] he will say every kind of mathematics is culturally embedded and therefore it is a version of ethnomathematics [...] If you look at the published literature of ethnomathematics, one will see that this definition is not really brought in action.

Similar sentiments were expressed by Cynthia who noted, “D'Ambrosio's conceptualising of it has transformed in different ways over the years, from maybe how he initially began to think about it”.

Several scholars also echoed sentiments similar to Dave's earlier words regarding the synergy between ethnomathematics and critical mathematics. For example, Gale shared, “I think that it's through ethnomathematics that I'm able to open up the dialogue of critical mathematics [...] because it brings forward the stories of mathematics that have been othered, if that makes sense”.

While some are acknowledging the challenges of ethnomathematics and the misinterpretations and misuse of the term, others are advocating for a more thorough understanding of how ethnomathematics was conceptualised by D'Ambrosio. Still others recognise the possibilities for shifting our perspectives and decentring Western mathematics through an ethnomathematical approach. Certainly, the discussion continues.

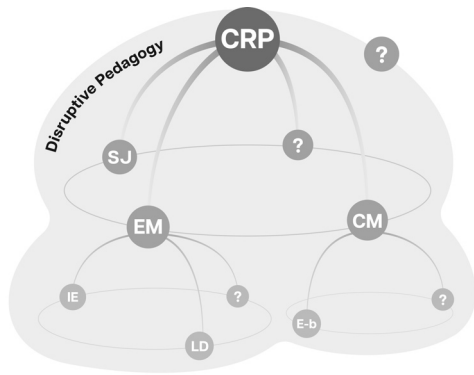
Concluding thoughts and an invitation to respond

As we analysed the interviews and reflected on our colleagues' voices, we discussed with each other how we would each presently position ourselves within this CRP conceptualisation, with the interviews and analysis now behind us. In our efforts to portray some of the fluidity that we noticed, we each constructed a model that sought to capture our thinking and positioning within the conceptualisation. The models serve to follow up on the one presented earlier when describing how the course was designed. These new models, however, capture more of the complexity and multi-dimensionality involved in describing CRP and one's scholarly work. The model designs are shown in Figures 2 and 3 (overleaf), and briefly explained by each of us.

Interpretation by Kathy: The interviews with mathematics education scholars helped me to recognise that I do not actually see all six sub-fields on the same 'level' with each other. In fact, for me, using CRP as the umbrella term represents my way into (my dream of) a version of mathematics that is informed by SJ, EM, and CM concerns. Secondary concerns of IE, LD (and perhaps another not-yet-articulated sub-fields, as depicted by the ?) emerge for me out of EM, while E-b could be thought of as emerging from CM concerns.

Interpretation by Lisa: As I began to sketch out a model, I realised an umbrella was not how I was conceptualising the influences in my work. I instead conceptualised spheres of influence on my work with an overall goal of decolonising mathematics education. Like Kathy, there are some fields more evident in my work (IE, LD, and E-b), some that inform my work (SJ and EM) and some that I see as connected but not central (CRP and CM), or at least I have not made them so. I have my spheres interacting because I find it difficult to make clear distinctions amongst the various fields and often wonder if it is something else entirely that describes my work.

We invite the reader to consider what their model looks like and how its relationships might be described. We hope our invitation will lead to an ongoing conversation about these interconnected fields on a journey to a more nuanced



CRP - Culturally Responsive Pedagogy, EM - Ethnomathematics, CM - Critical Mathematics, IE - Indigenous Education, SJ - Social Justice, LD - Language Diversity, E-b - Equity-based, ? - Other

Figure 2. Kathy's Perspective.

understanding of how we describe the work we do that seeks to disrupt mathematics education.

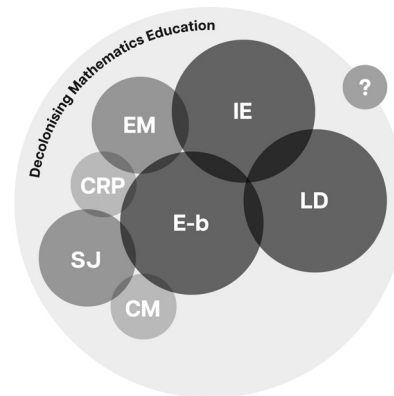
In line with this invitation to respond, we close by reflecting on two key areas.

Firstly, we highlight the importance of holding these ideas in complex, rather than reductionist, relationships with each other. We acknowledge that, at times, the drive to offer coherency or efficiency in our teaching, with our students, can push us into spaces that confine our ideas, rather than expand them. As one who resisted positioning her research according to the provided sub-fields, Betty offered:

For me, it all fits together. But I would say it's not labeled in any of these ways. Now, I am actively *engaged* in these communities, because this is the way mathematics educators define it, right? But at the root of all of the experience and the honoring and enactivism, you're always bringing forward worlds of significance. And so how you identify your lived experiences, [...] your languages [...] it's all there in its entirety. So, the separation is really hard for me.

We wonder what affordances come from our exploration of these various fields and what gets lost in the naming. Should we resist naming entirely? Perhaps what matters more than what we name our approach is the intentionality we bring to it. Who are we serving with these labels and how are they leading to real transformation and disruption in mathematics education? There may be merit in resisting labels, and to instead focus on processes that bring forth new worlds in mathematics education.

Secondly, we desire to close this article in a way that acknowledges the fluidity of the project, the fluidity of scholars' careers, and the fluidity of these six (and more) sub-fields in how they relate to each other and to the work of mathematics educators. In other words, those relationships,



CRP - Culturally Responsive Pedagogy, EM - Ethnomathematics, CM - Critical Mathematics, IE - Indigenous Education, SJ - Social Justice, LD - Language Diversity, E-b - Equity-based, ? - Other

Figure 3. Lisa's Perspective.

or 'ways of describing' one's work, shift and pivot depending on the research context, collaborators, funding agencies, who is speaking, who is listening, and when.

Note

[1] The 21 mathematics education scholars interviewed for the research study are: Andrew Brantlinger, Anna Chronaki, Annie Savard, Bernice (pseudonym), Betty (pseudonym), Cris Edmonds-Wathen, Cynthia Nicol, Dave Wagner, Edward Doolittle, Elaine (pseudonym), Gale Russell, Lisa Lunney Borden (also co-author of this article), Margaret (pseudonym), Morgan (pseudonym), Nancy Chitera, Ole Skovsmose, Rico Gutstein, Robin Averill, Ruth Beatty, Sonya (pseudonym), and Steve (pseudonym).

References

- Bartell, T.G. (2013) Learning to teach mathematics for social justice: negotiating social justice and mathematical goals. *Journal for Research in Mathematics Education* 44(1), 129–163.
- Darragh, L. (2016) Identity research in mathematics education. *Educational Studies in Mathematics* 93(1), 19–33.
- Foote, M.Q., & Bartell, T.G. (2011) Pathways to equity in mathematics education: how life experiences impact researcher positionality. *Educational Studies in Mathematics* 78(1), 45–68.
- Lunney Borden, L. (2021) Decolonising mathematics education in a time of reconciliation. In Andersson, A. & Barwell, R. (Eds.) *Applying Critical Mathematics Education*, 47–70. Brill.
- Martin, D.B. (2019) Equity, inclusion, and antiblackness in mathematics education. *Race Ethnicity and Education* 22(4), 459–478.
- Meaney, T., Trinick, T., & Fairhall, U. (2013) One size does NOT fit all: achieving equity in Māori mathematics classrooms. *Journal for Research in Mathematics Education* 44(1), 235–263.
- Nolan, K. (2020) Conceptualising a methodology for reframing mathematics/teacher education through a new (disruptive) form of culturally responsive pedagogy. In White, P. J., Tytler, R., Ferguson, J & Cripps Clark, J. (Eds.) *Methodological Approaches to STEM Education Research*, 133–153. Cambridge Scholars Publishing.
- Stinson, D. W. (2017) Beyond White privilege: toward White supremacy and settler colonialism in mathematics education. *Journal of Urban Mathematics Education* 10(2), 1–7.
- Wagner, D., & Herbel-Eisenmann, B. (2014) Identifying authority structures in mathematics classroom discourse: a case of a teacher's early experience in a new context. *ZDM* 46(6), 871–882.