“Who am I to say?”:

Mathematics Teachers and the Moral Weight of Pedagogical Responsibility

By

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A dissertation submitted in partial fulfillment of

the requirements for the degree of

Doctor of Philosophy

(Curriculum and Instruction)

at the

UNIVERSITY OF WISCONSIN - MADISON

2026

Date of final oral examination: 04/28/2026

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Acknowledgements

This dissertation would not exist without the people who held me together while I was writing it.

To my advisor, Nicole—my guiding light throughout this entire process. She has sat with me through tears, frustration, and uncertainty, and has consistently helped me question the responsibilities I was holding myself to—reminding me that the measures through which I had to prove myself were not measures of my worth, while giving me exactly the guidance I needed to meet them anyway. She deserves all the flowers.

To the rest of my committee, current and past, who have each contributed something essential to my development as a scholar. Erika consistently pushed me to consider what makes my choices ethical and critical, deepening my understanding of the politics of mathematics education in ways that shaped this project at every turn. Rosemary has not only been available for advice when I needed it most but has helped me find joys outside of academia that center what I care about most deeply: creating meaningful mathematical experiences for learners. To Priyanka who supported my journey through earlier stages of this work and helped me develop my voice as a scholar. And to Rich, who I am deeply grateful to for jumping in at the last minute with such generosity.

To the people who have made Madison feel like home. To Bri, my roommate of five years, who brought much-needed laughter and lightness to my evenings. To Burcu and Anshika, whose friendship has meant everything—for listening when I needed to vent and celebrating with me when there was something worth celebrating. To Arati and Rahul, who have been my rocks in the mathematics education department—as collaborators, co-instructors, and friends

whose presence made this work feel less solitary. And to the members of writing group, past and present, who received my messiest ideas with grace and thoughtful feedback, particularly Wan-Yue.

To Emery, my partner and best friend. His warm hugs, home-cooked meals, and thoughtful conversation made every stressful day that much better. I cannot imagine what it would have been like to work on this without him—or without the constant affection of Murphy and Oliver, who never once asked me how the writing was going.

To my mom and my aunt, who have been role models to me throughout my life. Without their support—in every form it has taken—I could not possibly have gotten to where I am today.

And to all the teachers in my life, including those who trusted me with their stories for this study. You give me hope in the future.

In a different sense, I also want to acknowledge my use of Claude, an AI language model, as a writing tool in drafting this dissertation. Although I have serious ethical reservations about the use of AI (as described in Appendix G), it nonetheless provided a collaborative and reassuring space during a process that was otherwise isolating and emotionally taxing.

Abstract

How mathematics teachers experience their pedagogical responsibilities is rarely given space in research on teachers' professional learning, which tends to focus instead on practice, knowledge, or beliefs. Yet teachers' lived experiences—the moral weight of competing demands, the emotional cost of decisions that cannot honor every commitment simultaneously, and the work of maintaining a sense of self amid irresolvable uncertainty—play a critical role in how they navigate the contradictions of their work. This dissertation addresses two related questions: How do mathematics teachers describe their pedagogical responsibilities? And how do they experience their varied responsibilities? Through in-depth interviews with four secondary mathematics teachers, this case study examines the narratives teachers draw on to make sense of their responsibilities and the tensions between them. Findings reveal that all four teachers prioritized relational over institutional content responsibilities—not as a retreat from instructional work but as a form of moral judgment. Teachers' experiences were shaped significantly by available social and material resources, which either helped them recognize structural contradictions as irresolvable or deepened self-doubt by framing impossible binds as implementation failures. Emotions of pride, enthusiasm, grief, and uncertainty were not incidental to teachers' decision-making but constitutive of it. These findings ask researchers and practitioners to take teachers' full humanity seriously—not as a supplement to understanding their practice, but as central to it. Teachers navigating genuinely competing responsibilities need conditions that allow them to name structural contradictions as real, sustain their moral commitments without bearing that weight alone, and make provisional decisions knowing that no single right answer exists.

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Chapter 1

Introduction

Every mathematics teacher makes dozens of decisions each day. Each decision moving in one direction is also a decision to set something else aside. Should this lesson prioritize the conceptual understanding that will serve students in the long run, or the procedural fluency that will serve them on Friday's test? Should class time go toward the student who is struggling to access the mathematics, or toward moving the rest of the class forward? Should I teach students content based on their prior knowledge or on the standards expected for their grade level? Should the curriculum be taught as written, or challenged—and if challenged, at what cost to students who will be evaluated against it? These are not questions that better training resolves. They are the condition of mathematics teaching itself: a set of genuinely competing responsibilities, each with its own moral logic, each making legitimate claims on teachers' time, judgment, and sense of self.

This study takes those competing responsibilities seriously—not as problems to be solved but as experiences to be understood. Drawing on in-depth interviews with four secondary mathematics teachers, I examine how teachers describe and make sense of their pedagogical responsibilities, and what it feels like to navigate the tensions between them. Specifically, this study is guided by the following questions: How do mathematics teachers describe their pedagogical responsibilities? And how do they experience their varied responsibilities? These questions are oriented not toward identifying what responsibilities teachers should feel, but toward understanding what teachers already know—about the purposes of their work, the limits

of any single approach, and the moral weight of decisions that inevitably honor some responsibilities at the expense of others.

Why This Study: Positionality and Problem Statement

Before starting graduate school at UW-Madison, I was working in New York City as a teaching assistant and instructional coach in middle school and high school mathematics. I chose to teach mathematics because it was something that I had always excelled in as a student and because I found satisfaction in figuring out difficult problems and wanted to help students experience that satisfaction and joy as well. Yet, when I started teaching, I felt unsatisfied with the regulations of schooling and the narrow view of the kinds of mathematics that children are expected to engage in. At the same time, I was becoming increasingly conscious of the structures in place that infringed upon children's learning experiences.

I quickly began questioning the content that we were teaching that, at worst, emphasized students' ability to regurgitate procedures and, at best, provided some opportunities for students to actively make sense of pre-determined mathematical concepts. It was clear that so many of my teaching team's pedagogical decisions had little to do with providing fruitful learning experiences for students and more to do with preparing students to pass standardized tests. Alongside teaching, I engaged in professional development workshops that helped me understand how white supremacy and capitalism operate in school systems and curricula. However, these workshops often framed solutions to systems of injustice in terms of alternative classroom management strategies and student-centered pedagogy, falling short of interrogating the injustices of the curriculum itself or providing opportunities to reflect on the purposes of the

content we were teaching and whether these purposes were meaningful to students. As a White teacher who taught predominately students of Color, I knew that I was always perpetuating the normalization of whiteness through the content that I taught but the only resources I was given focused on making experiences of assimilation more positive for students. At the time, I lacked the conceptual, material, and relational resources to imagine alternative visions of mathematics education that would be more just.

A desire to better understand the injustices I was seeing and how to support teachers in seeing and enacting more just educational models led me to pursue a Ph.D. in curriculum and instruction. I have focused my studies on understanding how teachers make sense of and find support to develop a praxis that aims to disrupt systems of oppression. My interest in mathematics teaching stems in part from my experiences teaching mathematics and wanting to interrogate my own beliefs about the purpose and content of the mathematics that K-12 students are expected to learn. As I have come to understand critical perspectives in mathematics education research, my own critical lens has developed, sharpening my sense of how dominant narratives and institutional systems function to normalize rationales of mathematics education that preserve systems of white capitalist supremacy and abnormalize those that challenge these systems (Gutiérrez, 2013; Martin, 2013).

Each vision of mathematics education I encountered carried its own moral logic, its own account of what teachers owed their students and why. Individually, each was compelling. Yet as I wrote about these distinct purposes—justifying their transformative rationales while also describing their limitations—I began to notice that my own framing was reproducing the very

problem I was trying to name. I was positioning teachers as somehow obligated to respond critically to every possible articulation of what mathematics education should accomplish. The options, as I had framed them, were either that teachers had to hold all of these visions simultaneously or they would never do enough. When my advisor challenged me to sit with that observation, I found myself returning to my own teaching experience—to what it actually feels like to carry that weight, to be perpetually falling short of an impossible standard, not because of inadequate commitment but because the standard itself is out of reach.

My attention shifted from the frameworks to the teachers navigating between them, and from what teachers knew or believed to what they felt—the weight of decisions that couldn't be gotten right, the cost of commitments that couldn't all be honored simultaneously. I found that the scholarship on teacher sensemaking gave me useful tools for understanding how teachers interpret their situations, but it treated that interpretive work as largely cognitive, as a matter of knowledge and framing, in ways that left the emotional and moral dimensions of that work undertheorized. It was not that teachers lacked the frameworks to understand what they should do. It was that knowing what you should do and being unable to do it, or doing it and knowing its costs, produces something that feels less like a knowledge problem and more like grief. The decisions teachers make in impossible situations are not only interpretations—they are moral and emotional commitments that implicate who they are and what they can live with. This felt obvious to me from my own experience—as someone for whom the affective dimensions of moral uncertainty have never been separable from the intellectual ones, and who has felt genuine grief in response to the everyday experience of not knowing how to act rightly. Yet I struggled to

find it named in the literature I was reading—a gap that became the orienting problem of this study and required looking not at what judgements teachers made but at what those judgements cost them.

The gap I experienced—between what the scholarship asked of teachers and what it acknowledged about the weight of that asking—is not incidental to mathematics education specifically. It is produced by the particular stakes of the field: the ways mathematics has functioned historically as a gatekeeper, a sorting mechanism, and a site of contested social and political purposes. To understand why teachers of mathematics face dilemmas that feel irresolvable, it is necessary to understand the terrain they are navigating.

Research in mathematics education has drawn sustained attention to the persistence of dominant logics across multiple iterations of reform. Critical scholars have situated seemingly distinct mathematics education models within their historical and political contexts, revealing that progressive reforms often lack a substantive rationale for the aims they claim to promote—reproducing, beneath new rhetorical frameworks, the same structures they purport to challenge (Bullock, 2019; Harouni, 2015; Skovsmose & Penteado, 2015; Valero, 2017). Equity, in particular, has functioned less as a transformative commitment than as what Apple (1992) calls a slogan system—offering an inclusive vocabulary without altering the broader systems that have upheld the unequal distribution of mathematical knowledge and its social rewards. Bullock (2019) makes this dynamic explicit in relation to race, arguing that standards-based reform operates as a racial remediation strategy: its language of inclusion leaves intact the ways whiteness structures mathematical ability and sustains deficit narratives about Black students'

mathematical potential. What such critiques reveal is not simply that reform has fallen short of its promises, but that the systems that mathematics education is embedded in—systems organized around social stratification, racial hierarchy, and the reproduction of economic inequality—have remained structurally intact across every iteration of change.

Despite the challenges that critical scholarship has posed to dominant norms in mathematics education, those norms continue to shape school policies, cultures, and teaching expectations in ways that rationalize deficit narratives about students of Cand delegitimize non-dominant ways of knowing (Gutiérrez, 2013; Horn, 2018; Louie, 2017; Scott, 2020). This persistence is sustained by the particular power mathematics holds as both a presumed marker of intellectual ability and a prerequisite for access to higher education and economically valued careers (Apple, 1992; Valero, 2017). Because of this positioning, attempts to challenge the rationales underlying mathematics education are easily framed as themselves unjust: if teachers prioritize critical engagement with mathematical knowledge over the transmission of institutionally valued skills and content, they risk leaving students without the credentials and competencies that the existing system rewards. Yet if they prioritize preparation for that system, they risk reproducing the deficit narratives and inequitable sorting mechanisms that critical scholarship has worked to dismantle. This is not a dilemma that can be resolved through better pedagogy or more inclusive curricula—it is structural, produced by the simultaneous demand that mathematics education prepare students for an inequitable system while also challenging the inequities that system produces.

Research oriented toward supporting mathematics teachers has made important contributions to understanding how teachers learn to enact more equitable and student-centered approaches, and how systems constrain the possibilities for transformative teaching to take hold (Horn, 2018; Louie, 2017). Yet this scholarship has been less attentive to what it costs teachers to navigate these constraints—the emotional weight of being pulled in competing directions, of knowing that any decision made in service of one purpose may compromise another, and of carrying that uncertainty without institutional recognition that the bind itself is real. The variety of transformative visions legitimized within mathematics education research has expanded what teachers are asked to be and do, without equally attending to the experience of holding those demands simultaneously and finding no way to honor them all. This study begins from a different premise: that teachers deserve to be understood in their full humanity—as moral and emotional beings whose identities, experiences, and sense of self are implicated in how they understand the purpose of their work and make provisional decisions in conditions of genuine, irresolvable uncertainty.

What Follows: Organization of the Study

The chapters that follow develop this argument across several moves. Chapter Two reviews the literature on mathematics education and teacher responsibility, situating the competing purposes teachers navigate within their historical and political contexts and examining how existing scholarship has attended—and failed to attend—to the emotional and moral dimensions of teachers' work. Chapter Three presents the theoretical framework that guides this study, drawing on perspectives including sensemaking, identity, emotion, and

resources to develop an account of pedagogical responsibility as sensed rather than simply known and enacted. Chapter Four describes the study's methodology, including the research design, participant selection, and data collection and analysis—articulating my attention to narratives that reveal teachers' experiences. Chapter Five and Six present the findings in two parts, examining first how teachers describe and prioritize their responsibilities and then how they experience the identity and resource binds that shape their navigation of competing demands. Chapter Seven returns to the questions that opened this study, considering what the findings reveal about the conditions that make teachers' work sustainable or demoralizing, and what it would mean to take the moral and emotional dimensions of pedagogical responsibility in mathematics education seriously.

What follows begins not with teachers' decisions but with the terrain those decisions are made within—the contested purposes, competing frameworks, and structural conditions that make mathematics teaching the morally and emotionally complex work that it is.

Chapter 2

From Obligation to Navigation:

Teacher Responsibility and Contested Purposes in Mathematics Education

Discussion of how teachers understand their responsibilities has been approached from psychological, sociological, and critical perspectives, offering differing conceptualizations of what matters when it comes to teachers' sense of responsibility. Looking at the studies that examine responsibilities as understood by teachers themselves, common themes arise, revealing that teachers' sense of responsibility is multidimensional and includes both ethical and institutional obligations. Yet, much of this literature has predominantly been used to conceptualize what it means for teachers to be personally or professionally responsible, with little attention to how teachers manage responsibilities when they compete with one another. I begin this section by describing the landscape of what we know about teachers' sense of responsibility before outlining the theoretical perspectives that frame this study. In doing so, I aim to show that while we know that teachers have multiple responsibilities that compete with one another, we know little about how the tensions that arise between competing responsibilities are felt at a personal level.

Multidimensional responsibility

Teachers have a host of formalized professional duties as well as tacitly understood ethical values that generate expected rules and norms. Their resulting responsibilities encompass everything from covering mandated curriculum standards to knowing each student on a personal level. Beyond simple reflections of teachers' accountability to policy demands and professional

contracts, pedagogical responsibilities represent teachers' sense of obligation to students, families, and the social and cultural values to which they ascribe. As Kuhlmann (2022) observes, "No other concept is as encompassing of educators' role as responsibility; it designates the educator's feelings toward the child, the educator's obligations to society, and the objective of education itself" (p. 65). In other words, teachers' responsibility is fundamentally relational, encompassing their relationship to students, to their discipline, to institutions, and to society. But what exactly do teachers feel responsible for? And how have researchers studied this phenomenon?

From efficacy to felt obligation

Early research on teacher responsibility focused primarily on efficacy—the extent to which teachers attributed student outcomes to their own actions versus external factors (Guskey, 1981; Winter et al., 2006). This work positioned responsibility as a matter of locus of control: teachers who felt responsible for outcomes demonstrated greater initiative and persistence in their practice. From this perspective, responsibility was treated as a relatively stable characteristic—something teachers possessed in greater or lesser degrees—that could predict their instructional choices and professional commitment.

Lauermann and Karabenick (2011, 2013) challenged this efficacy-centered view, arguing that responsibility should not be conflated with control or outcomes that teachers can achieve. Teachers' sense of responsibility, they contend, reflects internal obligation and commitment to produce or prevent certain outcomes, “or that these outcomes should have been produced or prevented” (2011, p. 227)—regardless of whether those outcomes feel fully within their power to

achieve. This conceptual shift reframes responsibility as something teachers feel—a sense of what they should do—rather than simply a belief about what they can accomplish.

This move from efficacy to felt obligation was significant. It recognized that teachers might hold responsibilities even when circumstances constrain their capacity to fulfill them, and that responsibility operates at the level of values and commitments, not just perceived control. Lauermann (2014) describes six dimensions that capture the complexity of responsibility: Who is responsible? For what outcomes? To whom? Judged by whom? By what criteria? In what realm? These dimensions reveal that responsibility is not singular but multifaceted—a teacher might feel highly responsible for students' mathematical understanding (one domain) while feeling less responsible for their test scores (another domain) or might feel accountable to students' wellbeing when judged by their own standards but uncertain when judged by administrators' priorities.

Responsibility as multidimensional and context-dependent

Research across educational psychology, sociology, and teacher education has built on this foundation, establishing several key insights about teachers' sense of responsibility. First, responsibilities are multidimensional, extending beyond academic achievement to include students' wellbeing, motivation, belonging, and future opportunities (Broadfoot et al., 1987; Lauermann, 2014; Matteucci et al., 2017). Teachers do not hold a single, unified sense of obligation but rather multiple, overlapping responsibilities shaped by different domains of their work.

Second, responsibilities are context-dependent. What teachers feel responsible for varies across school settings, student populations, policy environments, and institutional cultures

(Broadfoot et al., 1987; Lauermann & Karabenick, 2013). For example, Broadfoot and colleagues' (1987) comparative study of French and English teachers revealed stark differences: English teachers emphasized responsibility for the "whole child" (academically, socially, and emotionally), while French teachers oriented toward curricular objectives and instructional practice—differences reflecting centralized versus decentralized policy systems and distinct professional cultures. Context shapes not just what teachers prioritize but how they understand the scope and nature of their role.

Third, responsibilities are hierarchically structured within individuals—teachers organize their various obligations according to perceived importance and influence, which in turn shapes their instructional choices (Lauermann, 2014; Matteucci et al., 2017). A teacher who prioritizes students' sense of belonging may make different pedagogical decisions than one who prioritizes content coverage, even when both acknowledge multiple responsibilities. This hierarchical structuring suggests that teachers actively interpret which obligations take precedence, rather than responding uniformly to all demands placed upon them.

Fourth, teachers distinguish between personal and formal responsibilities—what they feel internally obligated to do versus what institutional roles demand (Lauermann & Karabenick, 2013). This distinction recognizes that teachers' sense of responsibility is not simply a reflection of job requirements but involves ethical commitments that may align with, exceed, or even contradict institutional expectations.

What this research orientation obscures

This body of work has made crucial contributions: it establishes that teachers hold multiple responsibilities simultaneously, that these responsibilities are felt rather than merely prescribed, that they vary across contexts, and that they shape teachers' pedagogical decisions and job satisfaction. However, much of this research has been oriented toward identifying patterns and predictive relationships rather than examining the interpretive work teachers do when navigating competing obligations.

First, the interpretive work of navigation is obscured by research focused on documenting what teachers report believing in general. When responsibilities compete in real time teachers must actively interpret the situation and make provisional choices (Lampert, 1985). Understanding this requires examining not just what teachers report feeling responsible for but how they make sense of particular dilemmas as they arise. Second, the emotional and identity stakes involved in navigating competing obligations are flattened by treating responsibility as a variable to be measured. These affective and identity dimensions shape which responsibilities feel urgent, achievable, or impossible in particular moments—but they are not captured by research focused on establishing correlations between responsibility profiles and outcomes. Third, research establishing that responsibilities are multidimensional and hierarchically structured often treats these as stable characteristics to be documented; teachers have hierarchies of responsibilities that vary across contexts (Lauermann, 2014). But this framing assumes that teachers successfully resolve competing obligations into workable hierarchies. Responsibility may not be something teachers clarify through better reflection or more refined priorities, but

something they navigate provisionally, making context-dependent choices, knowing that no hierarchy can address all situations when purposes conflict.

What educational psychology research reveals is important: teachers hold multiple, hierarchically organized, context-dependent responsibilities that shape their practice. What it has not deeply examined is how teachers experience the ongoing work of navigating these responsibilities when they compete—the interpretive processes involved, the emotional labor required, the identity negotiations at stake, and the ways teachers live with ambiguity rather than resolving it. While this research documents what teachers feel responsible for, other scholarship has examined how teachers navigate moments when responsibilities conflict with institutional demands—particularly through acts of resistance that position moral agency as central to understanding responsibility. I turn to this work next.

Responsibility as moral agency

The previous section established that teachers' sense of responsibility is multidimensional, felt, and context-dependent—shaped by various internal and external factors but distinct from both efficacy and role expectations. However, understanding what teachers feel responsible for does not fully explain how they make sense of their responsibilities when competing obligations arise. This section examines scholarship that positions responsibility as a matter of moral agency and ethical judgment rather than technical implementation. If teachers are moral agents who exercise judgment about what they should do, then understanding their responsibilities requires attending to the constraints that make enacting moral judgment difficult—particularly accountability systems, fidelity discourses, and responsibilization

dynamics that position teachers as individually answerable for systemic failures. Together, these perspectives reveal that teachers' responsibilities are not simply felt obligations, but ethical commitments navigated within systems that may not support—and often actively constrain—their enactment.

Responsibility, accountability, and moral judgement

Understanding teachers' sense of responsibility requires distinguishing it from accountability. Biesta (2015) articulates this distinction clearly: accountability is transactional and technical, focused on measurable outcomes and contractual obligations; responsibility is relational and ethical, oriented toward responding appropriately to students' needs in specific situations. Accountability asks, "Did you meet the standard?" Responsibility asks, "Did you respond appropriately to this student, in this moment, given what was at stake?" While accountability can be codified, measured, and enforced through policy mechanisms, responsibility requires situated judgment about what matters when rules provide insufficient guidance or when following prescribed approaches would cause harm (Biesta, 2015; Stengel & Casey, 2013).

This distinction matters because it recognizes that teachers' sense of what they should do is not reducible to what they are told to do. Accountability systems presume that good teaching can be specified in advance and uniformly applied—that we can identify "best practices," mandate their implementation with fidelity, and measure whether teachers comply. Responsibility, by contrast, presumes that good teaching requires context-sensitive judgment—that teachers must interpret what students need in particular moments, sometimes in ways that

deviate from prescribed approaches (Chen et al., 2021; Stengel & Casey, 2013). This positions teachers as moral agents who actively interpret their obligations and exercise judgment rather than simply executing directives (Santoro, 2011; 2016).

This gap between external accountability and internal responsibility is not a deficit—it reflects the reality that what institutions demand is not always what students need, and what teachers believe they should do is not always what systems allow. Moreover, teachers may act in ways that conflict with their sense of what they should do while nonetheless maintaining those commitments as ideals. They perform compliance while working to preserve space for what Stengel and Casey (2013) call "response-ability"—the capacity to notice what students need and respond accordingly, even within constraining systems (Biesta, 2015; Horn et al., 2025; Santoro, 2016).

However, the ethical dimensions of teachers' responsibility extend beyond immediate responses to individual students. Teachers' moral agency also involves responsibility to challenge the structural conditions that harm students collectively and to reimagine education as an institution (Ernest, 2019; Gutiérrez, 2013; Higgins, 2003). Moral agency, from this perspective, requires not only responding to students' immediate needs but refusing to participate in systems that harm students—a dimension of responsibility that becomes particularly consequential in mathematics education, where the discipline itself functions as a gatekeeper.

Exercising this moral and ethical agency is neither straightforward nor without consequence. It requires the courage to navigate discomforting conversations, resist policies that harm students, and challenge colleagues or administrators who perpetuate inequitable practices

(Santoro, 2016; Stengel & Casey, 2013). Moreover, teachers' sense of morality is shaped not only by their personal values but by the obligations, expectations, and evaluative frameworks imposed upon them (Kelchtermans, 2005). When teachers believe students need opportunities for exploration but are told to prioritize test preparation, when they want to honor students' home languages but must prepare them for standardized English assessments, when they see tracking as harmful but work in schools that require it—they face genuine dilemmas about how to maintain professional integrity while meeting institutional demands that carry real consequences for students' futures (R. Anderson et al., 2022; Santoro, 2011). Teachers' agency lies not in freely choosing among options but in navigating contexts where competing responsibilities—to individual students, to collective justice, to institutional accountability, to their own values—cannot all be honored simultaneously.

Responsibility discourses and the difficulty of enacting judgment

While positioning teachers as moral agents honors their capacity for judgment, it does not eliminate the very real constraints on exercising that judgment and acting agentically. Fidelity discourses—which frame "good teaching" as faithful implementation of prescribed practices—position teachers' acts of adaptation or resistance as morally dubious precisely because they deviate from expectations (Santoro, 2016). When reforms are introduced as "evidence-based best practices," teachers who modify them to fit their contexts risk being seen as incompetent or as undermining student success (Biesta, 2015). These discourses create doubt: Who am I to deviate from what researchers say works? Am I serving students' interests or my own?

Santoro (2011, 2016) documents how this dynamic produces demoralization—a distinct phenomenon from burnout. While burnout results from depleted personal resources (exhaustion, stress), demoralization stems from the inability to access moral rewards within structural constraints. When accountability systems demand practices that conflict with teachers' ethical commitments—mandating scripted instruction when teachers believe students need responsive teaching, requiring test-focused lessons when teachers value deeper exploration—teachers experience moral distress. They question whether they are "good teachers" when institutional definitions of effectiveness contradict their professional judgment about what students need. Demoralization is not only a problem of teacher retention but a signal that the field has failed to honor the moral seriousness of teachers' work—treating as a personal failing what is actually a structural condition.

This dynamic is intensified by what Kuhlmann (2022) and McLeod (2017) term *responsibilization*—the discursive positioning of teachers as individually responsible for achieving broad social and educational outcomes that require collective and systemic change. Accountability policies expand the scope of what teachers are expected to accomplish (closing achievement gaps, ensuring college readiness, and maintaining high expectations for all students) while simultaneously constraining their autonomy through standardized curricula, high-stakes testing, and fidelity measures (Kuhlmann, 2022). Teachers are told they are responsible for equity while working in systems that perpetuate inequity (Louie, 2017; Martin, 2019). They become answerable to oppositional demands: state-imposed accountability that rewards measurable outcomes and social justice imperatives that challenge the validity of those very

measures (Biesta, 2015). Moreover, Stengel & Casey (2013) point out the limits on teachers' individual agency in that "conflicting ideas and discourses destabilize identity as well as instructional planning and possibility" (p. 130). In other words, teachers' moral perceptions are constrained by their frame of reference to imagine and interpret possible responses. The interpretations that teachers can draw on are shaped by discourses about what actions are "morally good" which are themselves contested—thus creating an impossible task, abounding with uncertainty.

Responsibilization obscures the structural constraints teachers navigate and positions their moral agency as sufficient to overcome systemic barriers, even when it is not. As McLeod (2017) argues, genuine responsibility requires recognizing teaching as collective work aimed at justice, not individual heroism aimed at compliance. These dynamics reveal that while teachers are moral agents who exercise judgment, that agency is always constrained by discourses, structures, and systems that shape what responsibilities feel legitimate, what choices seem possible, and what consequences follow from resistance. Teachers navigate not just competing responsibilities but competing frameworks for understanding what it means to be "responsible" at all—frameworks that carry institutional weight, professional legitimacy, and personal moral stakes.

Responsibility and contested educational purposes

The scholarship reviewed thus far establishes that teachers hold multiple, felt, context-dependent responsibilities and that they are moral agents whose judgment is constrained by accountability systems and institutional demands. Yet neither body of literature fully addresses a

fundamental question: *What is education for?* Teachers' sense of what they are responsible for cannot be understood apart from the purposes they believe education should serve—and in mathematics education specifically, these purposes are contested terrain. This section examines how competing visions of what mathematics education is for generate different—sometimes contradictory—responsibilities for teachers. First, I establish that multiple purpose frameworks coexist in mathematics education, competing for material and conceptual resources in ways that privilege dominant purposes over alternative visions. Then I identify what remains undertheorized: while scholarship recognizes that teachers must navigate competing purposes, few studies examine how teachers make sense of these purposes over time or what interpretive work is involved when purposes conflict in practice.

Contested purposes of mathematics education

Mathematics education scholars, policy makers, members of the general public and teachers themselves articulate multiple purposes for the discipline. These include purposes oriented toward workforce preparation and economic participation, complex mathematical reasoning and positive identity development, appreciation of mathematical beauty, broadening what counts as mathematical knowledge, and critical consciousness aimed at social transformation (Ernest, 2010; Gutiérrez, 2017; Lockhart, 2009; NCTM, 2018; Skovsmose, 1994). While there is overlap between these purposes and they are certainly not mutually exclusive, they reflect different loci of concern—differing in how outcomes are framed, what mathematical content matters, and what classroom practices are prioritized.

Between 2018 and 2020, the National Council of Teachers of Mathematics explicitly positioned the purpose of mathematics education as a critical conversation for the field. *Catalyzing Change in High School Mathematics: Initiating Critical Conversations* (NCTM, 2018) articulated three purposes of high school mathematics education: expand professional opportunities; understand and critique the world through mathematics; and experience the wonder, joy, and beauty of mathematics. Other books within the *Catalyzing Change* series—centering elementary and middle school mathematics (NCTM, 2020a, 2020b)—differ in that "expand professional opportunities" is replaced by "develop deep mathematical understanding"—a notable change suggesting that the implications of high school mathematics for future career opportunities carry particular urgency. The central argument across these documents is that it is not enough for educational systems to aim at just one purpose; all are necessary to support student flourishing irrespective of what future path students choose (Su, 2020). In articulating multiple purposes as simultaneously necessary, the field legitimizes diverse frameworks for teachers to draw on when making sense of their work.

Each purpose framework implies distinct pedagogical responsibilities, though the connection between purposes and teachers' sense of responsibility is rarely made explicit in the literature. When teachers understand mathematics education as serving particular ends, different aspects of their work become salient—different outcomes feel urgent, different practices seem necessary, different student experiences matter. While few studies directly examine how purposes shape teachers' sense of what they are responsible for, the logics embedded in different purpose frameworks suggest what teachers oriented toward those purposes would feel

responsible for. Figure 1 offers my synthesis of these implied connections, drawing on how scholars describe the goals, practices, and outcomes associated with different purpose frameworks. These purpose frameworks are analytically distinct but not mutually exclusive. In practice, teachers often draw on multiple frameworks simultaneously, mobilizing different responsibilities in response to contextual demands.

The table captures only discipline-specific responsibilities tied to particular visions of what mathematics education should accomplish. Absent are broader pedagogical responsibilities not unique to mathematics—such as "the duty of care for one's students, shared with all teachers" (Ernest, 2019)—which also shape teachers' sense of what they are responsible for (Chen et al., 2021; Lauermann & Karabenick, 2013). Furthermore, some purposes articulated in reform documents remain underspecified in ways that make associated responsibilities difficult to operationalize. For instance, while NCTM calls for students to "experience wonder, joy, and beauty," how this purpose translates into concrete pedagogical responsibilities remains vague—largely conceptualized as something that might emerge through pursuing other purposes rather than requiring dedicated instructional focus.

Purpose framework	Associated teacher responsibilities
Credentialing and opportunity access (NCTM, 2018; U.S. Department of Education, 2010)	• Ensure students master procedures and algorithms needed for future courses • Prepare students for high-stakes assessments to earn needed credentials • Cover mandated standards aligned with STEM pipeline expectations
Equity as achievement for all (Gutiérrez, 2012"dominant equity"; NCLB, 2002)	• Close achievement gaps and ensure all students reach grade-level standards • Maintain high-quality instruction and rigorous mathematics standards for all students • Remove barriers to advanced mathematics courses • Challenge deficit narratives about who is capable of doing mathematics
Equity as transformation of mathematical culture (Boaler & Greeno, 2000; Civil, 2002; Gutiérrez, 2012, "critical equity")	• Disrupt racialized and gendered constructions of mathematical ability • Legitimize students' cultural, linguistic, and epistemic resources in mathematical work • Attend to how classroom practices distribute authority, visibility, and voice • Interrogate how mathematics functions as a tool of stratification within and beyond schooling
Democratic participation and mathematical literacy (Ball & Bass, 2008; Moses & Cobb, 2001)	• Develop students' quantitative literacy to be able to interpret real-world data and statistics for purposes of analysis and social change • Incorporate mathematical tasks that encourage students to pay attention to truth, precision, and reasoning that are applicable beyond mathematical contests.
Critical Mathematics and sociopolitical consciousness (Frankenstein, 1983; Gutstein, 2006; Skovsmose, 1994)	• Connect mathematics to social issues • Develop students' capacity to use mathematics to understand and critique inequity • Foster sociopolitical consciousness through mathematical inquiry
Mathematical Beauty, Play, & Exploration (Boaler, 2015; Lockhart, 2009; Su, 2020)	• Provide opportunities for open-ended mathematical play and creativity • Help students appreciate mathematical patterns, structure, and elegance • Allow time for exploration without predetermined outcomes

Figure 1: Table of mathematics education research purpose frameworks and implied teacher responsibilities

These purposes need not be philosophically incompatible. In principle, one could imagine a mathematics classroom where students simultaneously develop workforce-ready skills, explore mathematical beauty, and interrogate social injustices—indeed, this is precisely what reform recommendations like those in the *Catalyzing Change* series (NCTM, 2018; 2020a; 2020b) advocate. However, in practice, these purposes must compete for scarce material resources: instructional time, curriculum materials, administrative support, professional development opportunities, and legitimacy within accountability structures (Martin, 2019; Valero, 2017). This competition is further entrenched by the structure of schooling itself, which is organized around the self-referential vertical logic of institutional mathematics—each concept building on the last in a sequence that presumes and rewards a particular kind of mathematical knowledge. Non-institutional approaches, such as critical or vocational mathematics, require contextual and embodied reasoning that is not organized around this logic (Brantlinger, 2022); they are not simply underfunded but structurally incommensurable with a system built around different ends.

Critically, this structural advantage extends beyond material resources to encompass the conceptual resources available for teachers to make sense of what counts as legitimate, responsible teaching (Horn, 2020; Louie, 2017). Dominant purposes do not simply receive more instructional time or funding; they generate richer discursive infrastructures that shape what teachers can think and articulate about their work. Purposes aligned with workforce preparation and measurable achievement come packaged with elaborate vocabularies, well-developed pedagogical frameworks, assessment tools, research literatures, and professional learning infrastructures (Apple, 2001; Valero, 2017). Teachers have access to detailed guidance on how to

"implement standards effectively," "use data to drive instruction," "scaffold toward proficiency," or "differentiate for diverse learners"—all oriented toward dominant achievement-focused purposes. By contrast, alternative purposes—such as interrogating mathematics' role in systems of oppression, honoring non-Western epistemologies, or centering mathematical play and exploration—offer fewer ready-made conceptual tools for teachers to draw on in daily practice.

This asymmetry constrains teachers' epistemic agency—their capacity to frame, articulate, and justify what purposes matter in their teaching (Horn, 2018; N. Louie, 2019; Philip et al., 2019). When dominant purposes monopolize the language of "good teaching," teachers who attempt to center alternative purposes must do additional interpretive work: not only enacting different practices but constructing language to legitimize those practices in contexts where established discourses render them invisible or suspect (Horn, 2020). Moreover, teachers' moral agency is limited by these same discourses that associate moral goodness with institutionally sanctioned purposes. Consequently, teachers are unable to make their own moral judgments without the language and tools to justify that their actions are in students' best interest even when they challenge the status quo.

For example, a teacher attempting to honor indigenous mathematical epistemologies or center students' funds of knowledge must often construct their own rationales, defend their choices against dominant metrics of "rigor," and translate their purposes into the language of standards and proficiency that administrators recognize (Civil, 2016; Gutiérrez, 2017). Even when teachers sustain this interpretive labor, alternative purposes often remain supplemental rather than central—pursued if time permits, if administrative support exists, if students have

already mastered test-ready skills (Harouni, 2015; Larnell et al., 2016). Alternative purposes remain marginalized not because teachers lack commitment but because they lack the conceptual scaffolding necessary to operationalize those commitments within systems built for other ends.

Yet research suggests that teachers do not simply default to dominant purposes. Studies show that teachers draw on multiple, sometimes contradictory frameworks when making sense of their work (Chen et al., 2021; Louie, 2019; Philip, 2011), and mathematics education scholarship legitimizes diverse purposes as resources for teachers to frame their pedagogical responsibility (Horn, 2020). What sustains teachers who cannot resolve the tensions they inhabit remains the question this study takes up.

Mathematics teachers navigating disparate responsibilities

Mathematics education research has increasingly recognized that teaching involves navigating dilemmas—moments where multiple legitimate options exist, where honoring one commitment requires compromising another, or where teachers must act despite uncertainty about what is "best." However, scholarship approaches this dilemmatic terrain with different assumptions about what teachers need. Some research frames dilemmas as practice-based challenges that teachers learn to navigate through participation in supportive professional communities that provide conceptual and identity resources oriented toward nondominant teaching practices (Chen et al., 2021; Horn & Garner, 2022; Louie, 2017; Nasir et al., 2014; Scott, 2020). Other scholarship frames dilemmas as political and ethical challenges requiring teachers to develop critical consciousness and strategic capacity to resist systems that perpetuate racialized harm and deficit narratives (Gutiérrez, 2013; Kokka, 2023; Kokka et al., 2025). These

orientations are not opposed—both recognize teaching as uncertain work—but they reflect different assumptions about what makes teaching dilemmatic and what resources teachers need to navigate it.

A significant body of work examines how teachers navigate dilemmas that arise when attempting to enact ambitious and equitable mathematics instruction—practices that center students' mathematical thinking, maintain high cognitive demand, and challenge status hierarchies (Horn & Garner, 2022; Horn et al., 2025; Nasir et al., 2014; Scott, 2020). This research positions ambitious and equitable instruction as non-routine, requiring responsiveness and adaptation to students' thinking, while treating this vision of instruction as relatively settled—investigating how teachers learn to enact it rather than questioning whether the vision itself is contested terrain. Rather than locating problems of instruction in individual teachers, this work names the structural conditions, conversational routine, and resources that shape teachers' opportunities to learn, namely, professional communities, identity resources, and institutional contexts that shape what teachers can imagine as possible and worthwhile (Chen et al., 2021; Horn, 2020; Louie, 2017; Scott, 2020).

This work acknowledges that identity and emotion shape teachers' navigation. Yet these dimensions appear primarily as factors influencing teachers' sensemaking about practice rather than as sites of ongoing tension themselves. What this body of work shares is an orientation toward resolution through improved conditions: better professional learning communities, richer identity resources, more coherent institutional visions, and collaborative opportunities to develop judgment. The dilemmas teachers face are genuine—but they are treated as navigable when

teachers have adequate support. What remains largely unexamined is whether teachers hold competing commitments about what mathematics education should accomplish—whether "ambitious instruction" itself is contested terrain where teachers navigate between purposes that cannot all be honored simultaneously.

Other scholarship positions the dilemmas teachers face as fundamentally political—about whether and how to challenge systems that perpetuate racialized hierarchies and violence in mathematics education (Chen, 2023; Gutiérrez, 2009, 2016; Gutiérrez et al., 2024; Kokka, 2023; Kokka et al., 2025). This work focuses on developing teachers' critical consciousness: helping teachers recognize how mathematics education functions to uphold white supremacy, patriarchy, and capitalism, and preparing them to resist deficit narratives and oppressive structures. The dilemmas teachers face are framed less as what instructional move to make and more as what kind of teacher to become and what risks to take in acting on critical commitments. Kokka (2023) examines "healing-centered educator activism" among mathematics teachers of Color who work to dismantle inequities while also fostering students' healthy relationships with dominant mathematics—recognizing that challenging the system and helping students succeed within it are both necessary. This scholarship recognizes that teachers' racial and political identities shape their motivation to resist and their capacity to act, and that teachers must navigate between helping students access gatekeeping credentials and challenging the systems that make mathematics a gatekeeper. Yet the focus remains on how teachers develop and act on critical commitments rather than on the sustained emotional labor required when no choice about what action is "right" feels fully responsible.

Gutiérrez's (2012) offers a third framing that complicates both practice-based and critical consciousness approaches. Drawing on the Nahua concept of *Nepantla*—a space between worlds where contradictions are held rather than resolved—as articulated by Gloria Anzaldúa (1987), Gutiérrez (2012) argues that teachers of Color navigate multiple, contradictory frameworks simultaneously and that this navigation itself is generative rather than simply difficult—allowing new knowledge to be birthed. The productivity of teaching lies partly in sustaining contradiction rather than finding better frameworks that resolve it; premature resolution obscures complexity in ways that reduce complex contextualized knowing. Instead, embracing Nepantla develops greater awareness and familiarity with uncertainty. This framing resonates with Lampert's (1985) foundational argument that dilemmas are constitutive of teaching, not problems to be solved but conditions to be managed through ongoing judgment. Gutierrez's (2012) argument aligns with the notion that teaching necessitates maintaining rather than resolving tension to prevent the reproduction of the hierarchies that educators aim to challenge.

Across these perspectives, a tension emerges between recognizing teaching as dilemmatic and orienting toward particular resolutions. Some scholarship recognizes that ambitious and equitable instruction is difficult to enact but treats it as a settled endpoint that better structural support can help teachers reach. Critical consciousness scholarship recognizes competing purposes but focuses on helping teachers develop commitments to challenge dominant ideologies rather than examining what sustains teachers when acting on those commitments proves impossible. Even Gutiérrez's (2012) call to maintain tension rather than resolve it is framed as

what teachers should do—a normative commitment to living with contradiction—rather than as examining what teachers experience when they do.

What remains underexamined across this literature is how teachers experience navigating dilemmas that are genuinely irresolvable. While this work acknowledges that identity shapes what teachers value and can imagine (Louie, 2017), that emotion infuses sensemaking about responsibility (Chen et al., 2021), and that resources and professional communities matter for navigation (Horn, 2020; Scott, 2020), these dimensions are treated primarily as factors influencing teachers' instructional decision-making rather than as sites where the costs of navigation accumulate. When teachers hold commitments to multiple purposes that compete for the same time, resources, and institutional legitimacy, what identity work is involved in making choices when each choice implicates who they want to be as teachers? What emotional labor is required when no choice feels fully responsible? And what role do resources play not only in supporting navigation but in shaping whether teachers experience irresolvable tensions as productive or depleting? The scholarship reviewed here establishes teaching as dilemmatic work but has not deeply examined the lived experience of that work—particularly what sustains teachers and what it costs them when maintaining tension shifts from generative to demoralizing.

Chapter 3

Responsibility as Sensemaking:

Theoretical Perspectives on Teachers' Navigation of Competing Responsibilities

As established in Chapter 2, teachers are constantly navigating dilemmas and making pedagogical decisions fraught with tensions stemming from the fact that there is no single "right" way to respond (Biesta, 2015; Lampert, 1985). To contend with these dilemmas, teachers must make judgment calls based on their ethical values, disciplinary expectations, and accountability to key stakeholders—tuning into their pedagogical responsibilities as the principles that shape their pedagogical actions (Horn, 2020). Yet when these responsibilities are themselves tinged with uncertainty, when they are framed by distinct interests and conflicting aims, the question of what teachers should do becomes genuinely unanswerable. These moments of irresolution turn our attention not to what teachers ought to do but to how they experience navigating responsibilities that cannot all be honored simultaneously, and what it means to exercise agency within that constraint.

Horn's (2020) concept of pedagogical responsibility—teachers' engagement with their obligations and constraints—offers a preliminary framework for understanding this navigation. As a theoretical construct, pedagogical responsibility centers the *what* and *why* of teaching, going beyond technical know-how to examine how teachers make sense of competing educational goals that produce pedagogical dilemmas. But pedagogical responsibility is not merely a cognitive stance. As this chapter argues, it is something teachers sense as well as think—shaped by who they are, what they feel, and what resources are available to them.

Understanding teachers' experiences of responsibility, therefore, requires theoretical frameworks that attend to identity, emotion, and resource infrastructures as constitutive of sensemaking rather than peripheral to it.

Teachers' experiences of their responsibilities and how they make sense of and navigate contradictions are currently undertheorized. This chapter articulates the theoretical perspectives useful for examining teachers' sense of pedagogical responsibility and how emotions, identities, and resources inform their experiences navigating inherent uncertainties. First, section 1 establishes experiences of uncertainty and tension as generatively rich spaces to explore teachers' sense of responsibility. Next, section 2 draws on scholarship in the field of teacher sensemaking to frame teachers' responsibilities as interpretive stances that teachers agentically participate in constructing, not as fixed narratives of obligation. Finally, section 3 centers identity, emotion, and resources as relevant to understanding teachers' experience of their responsibilities. Taken together, this literature speaks to the theoretical contributions of examining teachers' experiences to understand how they navigate competing responsibilities that are not just given but sensed.

Responsibility amid tensions and uncertainties

Because purposes conflict, teachers cannot determine once and for all which responsibilities should take precedence (Biesta, 2015). This uncertainty is not temporary confusion that better training could resolve, but an endemic condition of teaching (Gutiérrez, 2009; Lampert, 1985). Teachers constantly face dilemmas—instances when multiple valid but conflicting responses exist, in which case they must manage competing goods that cannot be simultaneously achieved (Lampert, 1985). While varying in their impact, each decision reflects

an implicit or explicit answer to the question, *what is education for?* (Biesta, 2015). A question for which the answer is neither straightforward nor impassive yet is often taken for granted.

Recognizing this, some scholars have called for more critical examination of the purposes of education and their contingent nature (Biesta, 2015; Harouni, 2015; Skovsmose & Penteado, 2015). This work posits that what is necessary is understanding how different domains of purpose relate to one another and how systems of power function to prioritize some purposes while undermining others. Biesta (2015) names these domains *qualification, socialization, and subjectification*—respectively, meeting specified qualifications, learning social norms and expectations, and developing a sense of independence in thought and action. Most would agree that education is meant to serve all three domains, often in intersecting ways. Yet, aims to measure the *effectiveness* of education in terms of student achievement reduce the function of education to that which is measurable and can be standardized. As Gutiérrez (2008) and others have importantly pointed out, the results of overemphasis on achievement outcomes not only undermine other educational goods but also rely on narrow and inequitable methods—further reifying racial and socioeconomic hierarchies. By centering racial achievement gaps as a central focus of education reform efforts aimed at expanding educational access, these narratives simultaneously position subordinated students (the lower end of the gap) as problems to be fixed and brought closer to their middle-class White counterparts as the presumed norm.

By examining questions of purpose more critically, those involved in educational decision-making may transfer attention from what is *effective* to what is *good* (Biesta, 2015). In terms of teachers' responsibilities, questions of what is *good* demand moral consideration

beyond what is offered by *evidence-based* practices that rely on "objective" promises about "what works" (Biesta, 2015; Philip et al., 2019). The aim of this scholarship, however, is not to offer an idealized image of good education, but rather to inspire asking the question, what makes education good? Including questions of, *good for what*? And *good for whom*? Questions that preclude a universal answer. In this way, they call upon moral and philosophical judgment. Judgements which are not based on implementation but on principled decision-making and practical trade-offs, knowing that not everything can be accomplished at once. It is what Lampert (1985) refers to as *dilemma management*—not making the "right" call or resolving a dilemma but making judgment calls that are rooted in a sense of self. In her words, "the dilemma manager accepts conflict as endemic and even useful to her work rather than seeing it as a burden that needs to be eliminated" (p. 192).

In the same vein, Gutiérrez (2012, 2016) contends that effective mathematics teaching within marginalized communities exists in the dilemmatic space between two contrasting ideas: *playing the game* of mathematics and *changing the game* by reenvisioning school mathematics and rewriting narratives about mathematical ability. Moving too quickly toward the latter—reimagining mathematics education wholesale—risks ignoring the immediate necessity of student achievement as measured by standardized tools. She argues that mathematics teachers much learn to live in the tension between these poles rather than in any swift resolution. This includes being responsible for knowing one's students while simultaneously allowing room for their unknowability; accepting responsibility for student learning while also relinquishing authority in service of student agency; acknowledging responsibility toward supporting students

as individuals, while also being responsible for their mathematical understanding. By embracing the tension between these competing imperatives, teachers can develop an authentic practice that is not based on "correct" ideals but on political clarity that balances different educational aims. The result admits the reality that discourses of achievement gaps are far-reaching, shaping teachers' practice in ways that cannot be ignored yet discourses are not fixed—teachers have agency in bending and subverting these discourses in subtle and important ways that can advance social transformation.

What this scholarship makes clear is that in the work of teaching, there is no one decision that is right. Teaching is inherently uncertain work, and yet teachers must make decisions regardless (Lampert, 1985). Lampert's framework of dilemma management and Gutiérrez's concept of the dilemmatic space both position this uncertainty not as a problem to be solved but as the generative condition in which teachers' most consequential meaning-making happens. When purposes conflict and resolution is impossible, teachers must interpret what matters, who they are, and what choices feel justifiable—and it is precisely in these moments that responsibility becomes visible as something actively constructed rather than passively received.

While plenty of scholarship makes clear that mathematics teaching requires navigating competing aims (Gutiérrez, 2009; Gutstein, 2006; Kokka, 2019). fewer studies closely examine how teachers experience and make meaning within the uncertainty this generates. Yet understanding how teachers live with tensions—rather than seeking clean resolution—is necessary for addressing the expanding demoralization of teaching and creating space for the kind of vulnerability that sustains meaningful work (Kelchtermans, 1996; Santoro, 2011). In this

project, I take these competing aims and questions of educational good as a starting point for examining teachers' experience of responsibility. The following sections develop the theoretical framework for doing so—drawing on sociocultural and situated perspectives to understand responsibility as an object of sensemaking, and on theories of identity, emotion, and resources to understand how teachers experience that sensemaking as consequential, affectively weighted, and unevenly supported.

Pedagogical responsibility as an object of sensemaking

Sociocultural and situated learning perspectives have built a foundation for understanding how learning is constituted by participation in practice-based communities and the construction of identities in relation to those communities (Wenger, 1998). Building on this, many scholars have used sociocultural perspectives to identify how teachers negotiate meaning within communities of practice (Chen et al., 2021; Horn, 2005; Louie, 2016), establish local and context-bound routines and interpretations (Horn & Little, 2010), and develop frameworks for noticing that further shape their interpretive practices (Louie, 2018; van Es & Sherin, 2008). I draw on these perspectives to explicate an understanding of teachers' responsibilities as objects of sensemaking.

First, it is necessary to clarify how I use *sensemaking* (or describe *making sense of*) in ways that are distinct from "learning" yet rooted in sociocultural and situated perspectives of learning. While sometimes used interchangeably, I distinguish between learning as conceived as "changes in participation over time" (Horn, 2020) and sensemaking conceived as an act of interpretation (Coburn, 2001; Odden & Russ, 2019; Weick, 2012). In other words, this project is

not examining evidence that changes in meaning-making have happened by looking at interactions over time. Rather, it examines teachers' interpretations of their responsibilities at a particular moment. Sociocultural and situated learning theories frames these interpretations as socially constructed, actively negotiated, and identity-laden (Wenger, 1998). This provides a useful framework for understanding teachers' sense of responsibilities as interpretations that teachers actively participate in constructing rather than a set of obligations that are externally directed.

Sociocultural perspectives explain the social conditions of sensemaking by connecting meaning to practice-based activities within social contexts. This has important implications for framing teachers' sense of responsibility; for one, it presumes that teachers are not making sense of their responsibilities in a vacuum. Teachers construct meaning alongside other teachers, in political and cultural contexts, and in relation to their students and their discipline that are all shaping what interpretations are made available to them (Horn & Garner, 2022; N. Louie, 2018; Zembylas, 2007). Their interpretation of any given responsibility is dependent upon what resources are available to justify that responsibility as legitimate and connect that responsibility to their pedagogical actions and self-identities (Horn & Little, 2010; Louie, 2017). Furthermore, persistent discourses about students, about teaching, and about what mathematics is for circulate through teachers' professional networks—and these discourses are never neutral. They carry racialized, classed, and gendered assumptions about ability, achievement, and what counts as legitimate knowledge (Leyva, 2017; Louie, 2018; Philip, 2011; Sengupta-Irving et al., 2021)

filtering which messages reach teachers and how they get taken up (Chen et al., 2021; Coburn, 2001; Horn, 2018; Scott & Louie, 2024).

Yet despite the persistence of dominant discourses, teachers exercise constrained agency in their sensemaking—seeking out resources, challenging conversational norms, and revising interpretations through inquiry (Horn & Little, 2010; N. Louie, 2018). Pedagogical responsibility is therefore neither fully determined by structures nor freely chosen, it is an interpretive stance that teachers actively construct through their reasoning, relationships, and contexts.

Sociocultural and situated perspectives explain the social conditions of teachers' sensemaking about their responsibilities but do not fully account for how teachers experience those conditions as individuals with particular identities, emotional investments, and histories. That experiential dimension is what the following section addresses.

Sensemaking as identity and emotional work within resource infrastructures

Throughout this study, I use the phrase "sense of responsibility" deliberately to capture responsibility's dual nature. Teachers *make sense* of their responsibilities cognitively and socially —interpreting what they should do through socially constructed reasoning and meaning-making —and they *sense* their responsibilities affectively—feeling what matters, what's urgent, what's at stake. Using "sense of responsibility" throughout this dissertation acknowledges that these dimensions are intertwined: teachers' understanding of their obligations cannot be separated from their emotional experience of those obligations. Furthermore, as this section claims, teachers' emotional experience is intrinsically related to their identities.

Teacher Identity and Responsibility

Three theoretical perspectives on identity are particularly relevant to understanding teachers' sense of responsibility. The first draws on sociocultural and situated learning theory, in which sensemaking is understood as a process of identity development. Expanding upon the previous section, this means that what and how teachers learn and negotiate meaning within communities of practice is a matter of developing an identity for themselves in relation to that practice (Horn et al., 2008; Louie, 2017; Wenger, 1998). In other words, teachers learn to be a teacher by figuring out who they are as a teacher, which is shaped by dominant discourses and practices negotiated within social activities (see also, Horn & Garner, 2022). Identity and sensemaking are thus inseparable —teachers do not first develop a stable sense of self and then make sense of their responsibilities from that fixed position. Rather, who they are as teachers is continuously negotiated through the very acts of interpretation and meaning-making that constitute their work. This means that when teachers navigate competing responsibilities, what is at stake is not just a pedagogical decision but a question of who they are.

The second claim, rooted in critical race theory and critical whiteness studies, is that individuals' socially constructed identities shape what interpretations are made available to them —and that this operates asymmetrically depending on one's positioning within systems of power. Based on their social identities, people are also differentially positioned within histories of racial stratification and cultural hierarchies that shape what interpretations feel commonsense, what patterns become visible, and whose knowledge is treated as legitimate (Crenshaw, 1989; Ladson-Billings, 1998; Leonardo, 2009). Applied to teacher sensemaking, this means that dominant interpretations positioned as "commonsense" are rarely neutral—they are rooted in racialized

discourses that continuously undermine the cultural knowledge and resources of students from historically marginalized groups (Ladson-Billings, 1995; Philip, 2011). For teachers who occupy privileged positions by way of their visible identities (cisgender, white, able-bodied) dominant discourses may feel like description rather than ideology, making it easier to accept normalized narratives as simply true rather than as expressions of power (Leonardo, 2009; Lipman, 1997; Matias, 2016; Philip, 2011). Teachers of Color, by contrast, who have experienced systemic racism, anti-Blackness, and xenophobia firsthand, may be more likely to notice racialized harm in dominant ideologies, and also more likely to bear the burden of that noticing (Kohli, 2009; Kokka, 2023; McKinney de Royston, 2020). They may carry a greater emotional weight when witnessing educational harms done to their students of Color and a feel a greater sense of responsibility to respond to those harms by advocating for their students, enacting relational care, and centering cultural ways of knowing (McKinney de Royston, 2020; Kokka, 2023). For White teachers and teachers of Color, their racial identities can influence their sense of responsibility by affecting their awareness of race and racial justice in relation to the educational experiences of students of Color. Importantly, these frameworks do not position social identities as fixed interpretive lenses but as deeply shaped by histories of social stratification designed to maintain white supremacist, patriarchal, and heteronormative systems of power—systems that make certain interpretations more epistemically accessible depending on one's social positioning.

The third claim draws on poststructuralist perspectives of identity as political and embedded in discourses of power. Rather than treating identity as either an individual characteristic or a social construction, poststructuralist approaches understand identity as an

experience of becoming—continuously constituted through discursive practices. What Zembylas (2003) describes as "conditions of possibility" (drawing on Foucault, 1979) shapes who and what a teacher might be. Identities are thus fragmented and dynamic, responding to shifts in discursive practices and sociopolitical contexts in which individuals perform identities in socially recognizable ways (Butler, 2006). This perspective is particularly generative for understanding emotion, since if identity is constituted through discourse, then emotional experience is not simply a reaction to events but is itself shaped by social norms about what teachers should feel and how they should express it (Hochschild, 1979; Zembylas, 2003), informing how they self-identify in relation to an experience. The following section develops this connection more fully.

These three perspectives on teacher identity overlap in the sense that, from each perspective, identity is not fixed but is mediated by social activity, by differential positioning, and by discourses of power. Where they differ is in relation to the questions they raise. Sociocultural theory asks: how do teachers develop identities in relation to their practice and negotiate them socially? Critical theory asks: how are these identities constructed within systems of power, and how does that shape teachers' ideologies? Poststructuralism asks: how do teachers' experiences of identity provide insight into the political contexts that shape what narratives are available for teachers to define themselves? While I do not claim to address all these questions, they have all informed my analysis by drawing my attention to identity as significant to teachers' sense of responsibility. In my findings, I discuss how teachers' identities as "good" teachers are at stake when they experience responsibilities as competing with one another. It is within these moments of dissonance that teachers must draw on their sense of self to determine what path

forward is consistent with what it means to them to be a good teacher (Lampert, 1985). These moments of dissonance are not only cognitive but affective—navigating competing responsibilities is experienced as emotionally weighted precisely because identity is at stake.

Emotions and responsibility

Teachers' emotional experiences are not simply reactions to the demands of their work; they are constitutive of how teachers make sense of their responsibilities and who they understand themselves to be. Zembylas (2003) establishes the theoretical foundation for this claim by explicating identity and emotion as mutually constitutive through discourse: emotion discourses—social norms and rules about emotional expression that are discursively constructed—shape teachers' sense of how they are meant to feel, which in turn constitutes their understanding of who they are as teachers. Sensemaking is therefore never emotionally neutral; it is an act of interpretation through the lens of an identity that is always shifting through engagement with emotional discourses. Three theoretical claims follow from this foundation. First, that identity and emotion are intertwined with sensemaking in ways that make navigating competing responsibilities an inherently affective experience. Second, that emotion rules and discourses regulate what feelings are legitimate for teachers to express and what supports are available for coping with the emotional costs of the work. Third, that conditions of vulnerability and uncertainty put teachers' identities as good teachers at stake in ways that generate not just frustration but demoralization—the erosion of the moral rewards that make teaching meaningful. Together, these claims reveal that understanding teachers' sense of responsibility requires taking

seriously not just what teachers think but what they feel, and what the structural conditions of their work make it possible to feel.

Sensemaking is emotionally weighted because identity is always at stake in the process of interpretation. Teachers want to see themselves as good and often enter the profession for moral reasons (Santoro, 2011), which shapes their reasons for adopting or rejecting new practices and ideological frameworks (Chen et al., 2021; Horn & Garner, 2022). Attaching one's sense of self to being a good teacher creates a perception of fragility—that one's moral integrity and belonging are under constant threat (Chen et al., 2021; Kelchtermans, 1996). This fragility is not merely perceived; accountability policies, parent scrutiny, and institutional demands have made the value of teachers' work a site of ongoing contestation (Santoro, 2011). As a result, when teachers make sense of a situation, they are simultaneously figuring out who they are in relation to that experience, and that process is imbued with feeling. Emotion shapes what feels rational and possible: feelings of inspiration and joy can motivate action while shame and frustration can deter it or incentivize a fear response. The emotions teachers experience signal what matters to good teaching and what responsibilities feel urgent.

This connection between identity threat and emotional experience has direct consequences for what sensemaking is possible. When identity is under threat, dominant narratives about good teaching offer commonsense frameworks that teachers can draw on to rationalize their interpretations—even when those narratives suppress deeper interrogation (Chen et al., 2021; Horn & Garner, 2022). Chen and colleagues (2021) illustrate this dynamic: mathematics teachers framed their pedagogical responsibilities in terms of modeling *love* and

teaching *life skills* to assuage a colleague's concern that she was failing her students. While these narratives limited opportunities for more transformative sensemaking, they also offered genuine emotional comfort—familiar frameworks within reach that could ameliorate the pain of feeling inadequate. These narratives simultaneously reinforced teachers' identities as good teachers and functioned as emotional resources in the face of vulnerability. What gets made sense of, and how, is never separable from what teachers can emotionally bear.

Emotions in teaching are not only experienced but also mediated—shaped by social norms about what feelings are appropriate, legitimate, and professionally acceptable to express (Hochschild, 1979). Teachers' emotional responses are largely shared—what causes them to feel shame, uncertainty, pleasure—reflecting the social nature of emotions (Hochschild, 1979; Lortie, 1967). What is felt, however, is not solely determined by emotional rules but rather an interactive phenomenon. It involves individuals' personal feelings *and* their management of emotional responses in relation to their understanding of the social norms that dictate which emotions are considered legitimate or valuable in a particular context (Hochschild, 1979). These norms are shaped not only by social activities but by the very structure of schooling, which disallows teachers the time and relational resources to cope with the everyday emotional demands of their work (Little, 1990; Lortie, 1975; Nias, 1996).

It is useful here to distinguish between emotional experience—how teachers feel—and emotional work (Hochschild, 1979): the work of managing those feelings to meet the demands of a professional role. Teaching requires both. Teachers not only experience emotions but actively manage them—suppressing frustration, performing enthusiasm, maintaining composure—in

ways that carry real costs (see also, Horn et al., 2025). When emotional labor is unsupported by collaborative structures or unrecognized as part of professional practice, it compounds the vulnerability teachers already experience (Kelchtermans, 2005). The result is that emotion rules and structural conditions together determine not just what teachers feel but what they are permitted to feel, and what costs they bear when their emotional experience exceeds what the system is designed to support. These rules are also shaped by gendered and racialized discourses so that what emotions are appropriate or how they are expected to be managed is not equally applied.

When teachers cannot act in accordance with their values, the result is not simply frustration but what Santoro (2011) terms *demoralization*: the erosion of moral rewards that makes teaching meaningful. Demoralization differs from burnout in a theoretically important way. Burnout is about capacity—teachers running out of energy. Demoralization is about meaning—teachers losing confidence that their work can accomplish what they believe it should. This distinction matters for understanding how teachers experience impossible binds: the problem is not that they lack the will or skill to navigate competing responsibilities, but that the structural conditions of their work persistently undermine the moral rewards that sustain their investment in doing so.

Kelchtermans (2005) develops this further through the concept of vulnerability—not itself an emotion but a structural condition of teachers' work that fuels emotional responses. Because teaching involves making ethical decisions for which there is no right answer, teachers' actions are always open to scrutiny, increasing their experience of powerlessness and their sense

of not being in control of the conditions that allow them to do their work well. Like Lampert (1985), Kelchtermans contends that vulnerability is not a feeling to be resolved but an inherent condition of the ethical work of teaching and the very condition that creates the possibility for pedagogy. As he writes, vulnerability is "not only a condition to be endured, but also to be acknowledged, cherished, and *embraced*" (2005, p. 999) because it positions teachers as responsible for outcomes that are genuinely consequential to students' lives. In other words, vulnerability creates the conditions for self-doubt, guilt, and anxiety—but also for joy, pride, and fulfilment. Teachers may experience powerlessness, but they are also positioned to make decisions that matter.

Kelchtermans' insistence that vulnerability be embraced rather than merely endured, alongside Lampert's framing of dilemma management as accepting conflict as endemic and even useful, together suggest that uncertainty need not generate demoralization. When teachers recognize that competing purposes are structurally irresolvable rather than personally solvable, uncertainty can offer a form of relief. For some teachers, the absence of a “right” answer may be experienced not as paralysis but as freedom—permission to make provisional choices with conviction rather than waiting for a certainty that will never arrive.

Whether vulnerability generates demoralization or the possibility of joy and fulfilment is not solely a matter of individual disposition; it depends on the conditions in which teachers work. The resources available to teachers, the communities they belong to, and the infrastructures that organize their professional lives shape what emotional experiences are possible and what

responsibilities feel sustainable. It is to these resource infrastructures that the following section turns.

Resources and responsibilities

Within teachers' communities of practice and networks of support and independent learning they encounter resources; frameworks, relationships, tools that are shared, taken up, adjusted, and rejected (Horn, 2005; Louie, 2017). These include *technical resources*—specific materials, tools, or strategies—*conceptual resources*—interpretive frameworks that normalize certain perspectives and behaviors—and *social resources*—including both teachers' positioning as experienced or knowledgeable and the quality of their relationships within learning communities (Louie, 2017; Horn, 2005). What matters analytically for this dissertation is not which category a resource belongs to but how resources function within particular infrastructures to shape teachers' sense of what is possible, legitimate, and worth investing in.

Resources do not function independently but are organized by social and material infrastructures (Jurow et al., 2019) that work together to denote what kinds of knowledge, ideas, emotions, and identities matter. Different resource infrastructures make different responsibilities feel salient, legitimate, or actionable in particular contexts (Horn, 2005; Louie, 2017; Scott & Louie, 2024). A professional development emphasizing growth mindset may connect a teacher to a responsibility for believing in all students' mathematical capability, while team meetings focused on test score data may pull that same teacher toward a responsibility for ensuring adequate progress toward benchmarks. These responsibilities, shaped by different resource infrastructures, may pull in different directions yet both feel justified within their respective

contexts, producing the fragmentation teachers experience when navigating multiple, often contradictory infrastructures simultaneously. Understanding how teachers navigate uncertainties within their sense of responsibility requires attending not only to what resources teachers access but to how those resources function emotionally and relationally—whether they expand teachers' interpretive possibilities or constrain them, whether they sustain investment or erode it, and whether they offer refuge in uncertainty or compound the demoralizing experience of impossible binds.

When resources are embedded in collaborative infrastructures that support what Horn et al. (2025) refer to as *relational agency*—the ability to seek out colleagues' expertise, broaden problem interpretations, and collaboratively construct responses—teachers can develop new understandings of their responsibilities and navigate competing demands with greater *epistemic agency*—the capacity to take responsibility for advancing pedagogical knowledge and adopting adaptive perspectives. Drawing on Hochschild (1983), the authors contend that responsive teaching comes with emotional rules about teachers' appropriate conduct in relation to their students (e.g. being welcoming, present, and respectful to their students) requiring that they manage their internal emotions in the face of challenges to their commitments (Horn et al., 2025). Hochschild (1983) identifies two ways of managing emotions: *surface acting*—masking appropriate emotions while experiencing discomfort from concealing true emotions—and *deep acting*—consciously regulating internal emotions to align with emotional rules by reframing their experience. Horn and colleagues (2025) found that teachers' relational and epistemic agency—fostered through a supportive and collaborative culture that offers access to alternative

interpretations of experiences—can provide them with the resources to engage in deep acting rather than surface acting, thereby aligning their actions with their genuine emotions. My own findings build on this work, exploring the emotional dimensions of teachers' experiences of their pedagogical responsibilities and how these experiences are shaped by material resources.

Responsibility as sensemaking: a framework for examining teachers' experience

The theoretical perspectives detailed in this chapter reveal the complexity of teachers' navigation of competing pedagogical responsibilities. Section 1 positioned tensions and uncertainty as conditions that reveal teachers' sense of responsibility as they determine how to respond to moments of conflict in which there is no single correct answer. Section 2 established pedagogical responsibility as an object of sensemaking shaped by contested purposes, available resources, circulating discourses, and systems of power. Teachers do not simply receive mandates and implement them—they actively make sense of *their role as teachers* in their particular contexts through the resources available to them. Section 3 established that this sensemaking is identity and emotional work mediated by resource infrastructures. When teachers internalize responsibility for achieving equity, their identities as "good teachers" become tied to outcomes they have limited individual power to control. These are not passive positions—teachers exercise agency by making strategic, emotionally informed choices about what they can enact in particular moments. Teachers' agency lies not in maintaining coherent responsibility across contexts—an impossibility when purposes conflict—but in navigating these tensions while managing the identity and emotional stakes involved.

Understanding pedagogical responsibility as sensemaking reveals that teachers are neither passive victims of structural constraints nor free agents capable of transforming systems through individual will. They exercise genuine agency: making decisions about what resources to engage, what risks to take, which responsibilities to foreground when they cannot honor all simultaneously. Taking teachers' moral concerns as legitimate principles of pedagogical responsibility honors this agency to act in relation to their students and in response to ethical obligations *(Santoro, 2011; Stengel & Casey, 2013).* Yet their agency is always exercised within contested terrain—shaped by institutional structures, available resources, racialized systems of power, and emotional capacity. Teachers make provisional choices knowing there is no right answer, navigating impossible binds with strategic judgment rather than philosophical coherence.

This theoretical framework guides the empirical examination that follows. Rather than evaluating whether teachers fulfill *reform* mandates or achieve coherence, the subsequent chapters examine how teachers make sense of competing obligations—how their identities shape what feels urgent or impossible, and how resources enable or constrain what seems achievable.

Chapter 4

Methodological Strategies for Examining Teachers' Experience of Their Pedagogical Responsibilities

Research design considerations

This study initially focused on how teachers agentively constructed and drew upon social support networks to shape their conceptualizations of mathematics education's purposes. However, this plan proved challenging: teachers had limited time to report on ongoing support-seeking practices and capturing the variety of ways teachers engaged with resources required greater access than was feasibly within this study's scope. After initial interviews, I shifted analytical focus toward teachers' conceptions of purpose and their related pedagogical responsibilities, while still attending to—though not comprehensively mapping—the resources shaping these conceptions. My familiarity with Horn's (2020) work on pedagogical judgment, combined with growing curiosity about how teachers navigated competing messages about mathematics education's purposes (Skovsmose, 1994; Valero, 2004), led me to refine my research questions: (1) *How do teachers describe their pedagogical responsibilities?* (2) *How do teachers experience their varied pedagogical responsibilities?*

To answer these questions, I employed a collective case study design (Creswell, 2007; Yin, 2009), examining four secondary mathematics teachers as individual cases to understand pedagogical responsibility as a phenomenon. Creswell (2007) describes case study as appropriate when "the inquirer has clearly identifiable cases with boundaries and seeks to provide an in-

depth understanding of the cases or a comparison of several cases" (p. 74). This methodology was particularly suited to my inquiry for several reasons:

First, my research questions focused on *how*—how teachers experienced and made sense of their responsibilities—rather than testing predetermined hypotheses about what responsibilities teachers held. As Yin (2009) argues, case study is the preferred method when research questions ask "how" or "why," when the investigator has little control over events, and when the focus is on contemporary phenomena within real-world contexts. My questions required sustained attention to teachers' meaning-making processes as they unfolded within their specific institutional settings.

Second, context was central to my theoretical framework. I positioned teachers' responsibilities as shaped by the resource infrastructures available to them, the institutional pressures they faced, and their professional and racial identities. Case study methodology recognizes that context and phenomenon are not easily separable; as Yin (2009) emphasizes, case study investigates "a contemporary phenomenon in depth and within its real-world context, especially when the boundaries between phenomenon and context are not clearly evident" (p. 18). I could not understand how teachers navigated responsibilities apart from understanding the specific pressures and supports characterizing their settings.

Third, I sought both depth and breadth—detailed understanding of individual teachers alongside insights transcending particular cases. The collective (or multiple) case study design supports this dual aim. Creswell (2007) notes that in collective case studies, "the one issue or concern is again selected, but the inquirer selects multiple case studies to illustrate the issue" (p.

74). Individual cases illuminated how specific contextual factors shaped responsibility navigation in distinctive ways, while cross-case analysis revealed patterns and tensions appearing across varied settings, suggesting broader dynamics in how teachers make sense of fragmented, competing responsibilities.

This approach aligned with my commitment to representing participants' experiences with complexity and nuance. Rather than aggregating responses to identify general themes, case study methodology enabled me to develop detailed portraits of each teacher's sensemaking while also drawing cross-case insights about how teachers navigate pedagogical responsibilities within their different resource landscapes. The following sections describe participant selection, data collection procedures, and analytical processes through which I developed these case-based understandings.

Participant Selection and Context

I employed purposeful sampling (Creswell, 2007), seeking teachers who taught mathematics at the middle or high school level. I excluded elementary teachers because I was interested in how participating teachers made sense of their pedagogical responsibilities specifically in relation to mathematics education. While elementary teachers also teach mathematics, their generalist role might make it difficult to disentangle their experiences as mathematics educators from their broader teaching responsibilities. My recruitment materials specified that I was investigating questions of educational purpose rather than instructional practice, signaling that I sought teachers who were already reflecting on what mathematics education should accomplish and who were willing to share those reflections.

I began recruiting through my personal network and by attending a national mathematics education conference, where I shared a recruitment flyer (see Appendix B) and discussed the project's intentions with interested teachers. I initially interviewed six teachers but selected four for continued participation based on the depth and complexity of their reflections and the variety of contexts they represented. These four teachers—Becca, Julie, Carlos, and Greta—taught in markedly different school contexts, were at different career stages, and brought distinct approaches to navigating their pedagogical responsibilities. While not representing a larger population, their varied experiences offered multiple perspectives for examining how teachers make sense of competing responsibilities across diverse institutional settings.

Participant Recruitment

Becca was recruited directly because she was a longtime friend with whom I had engaged in many informal conversations about mathematics education. Greta was also contacted directly as a local mathematics teacher who had participated in previous research projects focused on mathematics education. While she is the only participant who does not teach mathematics exclusively, her unique context at a progressive school offered valuable contrasts that extended the study's scope beyond typical secondary mathematics settings. Julie and Carlos were both recruited after I met them at the national conference and shared my recruitment materials with them.

Participants

Teacher	School Context & Student Demographics	Mathematics Course Assignments
Becca	**Northeastern Girls Academy (NGA)** • Public middle/high school in large city • All-girls school (including gender nonconforming students) • ~70% Hispanic* ~30% West African, Bangladeshi, and African American*	**Geometry** • Works with special education Co-teacher • One of the classes that students take a standardized exam for • Common core standards **8th grade Algebra**
Julie	**Willow Academy (Willow)** • Charter school with "IB for all" mission • Founded on Christian principles but does not follow religious curriculum • Newer school with small and growing student population • Racially diverse*: ⅓ Black**, ⅓ White**, ⅓ Hispanic or Latino, Asian American, or multiracial**	**Middle Years Program (MYP)** • 9th and 10th grade math • Covering topics from Algebra and Geometry **Diploma Program (DP)** • 2-year course for 11th and 12th graders • Covering topics from Statistics, Trigonometry, and Calculus • Includes Independent written project on topic of students' choice related to coursework
Carlos	**Red Rocks High School (Red Rocks)** • Title 1 public school in Southwest • Tracked math classes • Over 80% Hispanic & English Language Learners*	**Resource Geometry** • Geometry course designed for 10th grade students who need additional supports **Finance Math** • Course for 12th grade students covering mathematics topics related to finances • Students who complete this course receive a special diploma designation
Greta	**Sparrow Lake** • Private progressive primary school • Small student population with mixed-age classes • Located in Midwestern city • Over 80% White**	**Math class for graduating students** (Traditionally "8th grade math") • No curricular mandates • Mix of 8th-grade math and Algebra content

Figure 2: Table of teacher participants and school demographics

* Based on the teacher's informal reporting (more precise data not available)
** Based on data on Private school demographics from ProPublica

Becca teaches middle and high school mathematics at Northeastern Girls Academy (NGA), a public school in a large Northeastern city serving predominantly Black and Hispanic[1] girls along with a small population of trans or genderfluid identifying students. Her school follows mandated district standards aligned with Common Core, and her students take state-required standardized tests necessary for graduation and college admission. Despite these institutional constraints, Becca has actively sought out experimental and self-directed approaches to mathematics instruction, sequencing, and curriculum that diverge from traditional methods used by many colleagues. For the past five years, she has participated in an external professional development organization for mathematics teachers (which I call PDM), which provides learning communities and pedagogical resources beyond what her school offers. Becca has described PDM as offering culturally responsive and intellectually engaging alternatives to traditional mathematics instruction. This context—high-stakes testing combined with access to progressive professional development—created particular tensions in Becca's navigation of her pedagogical responsibilities.

Julie teaches high school mathematics at Willow Academy, a small K-12 private school in a large city with a racially diverse student population. Founded on Christian principles, Willow Academy's mission is to develop students as leaders driven by faith and inquiry, though

[1] Throughout this dissertation, I use the terms Black, White, and Hispanic when referring to racial groups, capitalizing Black and White to acknowledge race as a social construct with distinct historical and political meanings (APA, 2019). In Chapter 6, I use the language participants themselves used—primarily "Brown" to refer to people of Latin American descent and "African American" rather than Black—to honor their self-identification and the meanings they attach to these terms. When quoting participants directly, I preserve their exact language. (APA, 2019)

these Christian aims do not directly shape the mathematics curriculum. The school follows an International Baccalaureate (IB) curriculum and promotes an "IB for all" philosophy, holding all students to the program's rigorous standards regardless of prior academic preparation. In grades 9-10, Julie follows the Middle Years Program (MYP) curriculum, covering Algebra 1 and Geometry content while emphasizing mathematical practices and exploratory learning. In grades 11-12, students enter the Diploma Program (DP), where they complete independent mathematical investigations to earn IB credits. While Julie uses tests for assessment, the IB framework emphasizes students' demonstration of mathematical practices over procedural knowledge. At the time of our interviews, Julie was the only high school mathematics teacher and also served as the school's Title I instructor. This dual role and her professional isolation shaped how she experienced uncertainty about her instructional choices.

Carlos teaches high school mathematics at Red Rocks High School, a large public school in a Southwestern city. A substantial proportion of Red Rocks students are Hispanic and come from immigrant families. Carlos is also Hispanic—born in Mexico, fluent in Spanish—which he described as meaningful to his ability to identify with students and communicate with their families. During this study, Carlos taught two courses: Geometry for "resource" students (the school's designation for students with special needs or individualized education plans) and Finance Math, a senior-level course focused on financial literacy using Algebra 1 concepts. Students completing Finance Math could earn a "gold diploma" indicating additional mathematics coursework beyond standard requirements. While the district mandates curricular standards at Red Rocks, teachers design their own materials and assessments. The only

standardized assessment is the ACT exam, which students take in 11th grade. Carlos's shared racial and linguistic identity with many students, combined with his awareness of how tracking systems marginalized Hispanic students, shaped both what responsibilities felt urgent to him and how he strategically navigated where to invest his energy.

Greta is a general educator working with 11–14-year-old students at Sparrow Lake, a small progressive private school in a mid-sized Midwestern city with a predominantly White student population. She teaches collaboratively with two other teachers, sharing instructional responsibilities for integrated thematic units that combine multiple subjects. Mathematics is the only discipline taught separately, with students grouped by age, in which she teaches 10-12 students at a time. Greta teaches mathematics to the oldest students (would-be 8th graders in a traditional system), most of whom will transition to mostly to local public high schools at years end. As a private school, Sparrow Lake teachers have complete curricular autonomy with no mandated standards, no letter grades, and no required homework. The school's mission centers on developing students as democratic citizens with agency and responsibility toward their communities. This context—maximal institutional support for progressive teaching combined with near-total autonomy—allowed Greta to prioritize student agency and sensemaking without formal constraints, yet she still experienced pressures from dominant narratives about what mathematics education should accomplish.

Researcher Positionality

I am a White woman and doctoral student studying mathematics education with commitments to challenging dominant conceptions of what mathematics education should

accomplish. My teaching experience includes working as a teaching assistant in middle and high school mathematics classrooms, supervising mathematics tutors, and teaching elementary mathematics content courses to preservice teachers. During my time as a teaching assistant and supervisor, I worked with students that were predominantly Black and Hispanic at three different public schools in New York City. My background differs substantially from that of my participants, all of whom are experienced classroom teachers with primary responsibility for student learning and assessment. While my relationship to mathematics drew me to this project and shaped my critical interest in educational purposes, my intention in recruiting and engaging with participants was to defer to their expertise as practicing teachers. I did not enter this project from an evaluative stance; instead, I sought to position teachers as agentic knowledge bearers whose sensemaking merited careful attention. Throughout data collection and analysis, I aimed to include participants in the research process where possible, sharing the project's evolving intentions and inviting their reflections on my questions and interpretations.

My racial identity shaped my relationships with participants in ways I cannot fully know. I shared racial identity with three participants—Becca, Julie, and Greta—which may have influenced what they felt comfortable sharing and what remained unspoken. Because I did not explicitly ask questions about participants' or their students' racial identities in early interviews, my whiteness may have implicitly discouraged such discussions or signaled these topics were not central to the research. In contrast, Carlos, the only teacher of Color in the study, may have felt prompted to explicitly name how his racial identity shaped his teaching precisely because my

whiteness positioned us as having different cultural and experiential knowledge. These dynamics undoubtedly shaped the data, though in ways that remain partially visible to me.

Furthermore, I had a preexisting relationship with one of the participants, Becca. We had worked together at the same school and had been close friends for nearly a decade. I recruited Becca because she met the study's criteria and because we had discussed mathematics education extensively. I was confident that our friendship wouldn't prevent her from sharing her honest experience with me, even if her beliefs differed from mine. However, our relationship likely influenced my analysis of her interview data in unavoidable ways. While I tried to separate my personal knowledge and biases as a friend from my interpretation of the findings, my understanding of Becca and her context naturally extended beyond that of the other participants, shaping my interpretation of her experience.

Building Thinking Classrooms as Context

One additional element requires introduction: the *Building Thinking Classrooms* (BTC) framework developed by Peter Liljedahl (2020). While not a "participant" in the traditional sense, BTC nonetheless played a significant role in this study. Liljedahl's work has been widely popularized within mathematics education communities for its detailed and concrete recommendations that challenge traditional instruction while promoting student thinking. BTC featured prominently at the national mathematics education conference, where I recruited participants, with Liljedahl delivering a keynote address to an overflowing audience. I first learned of BTC through conversations with Becca, who enthusiastically endorsed its methods. Though I had not specifically sought teachers familiar with this framework, all four participating

teachers independently referenced Liljedahl's work as meaningful to their current practice—likely because this study coincided with BTC's rising notoriety in mathematics education.

Several features of the BTC framework warrant brief description given their prominence in interview data. BTC proposes 14 practices derived from Liljedahl's classroom experiments, testing which approaches most effectively promote student thinking. Liljedahl defines "thinking" in opposition to common student behaviors—mimicking, faking, slacking, stalling—that allow students to succeed by traditional metrics without genuine engagement. Three practices were most frequently referenced by participants: (1) Give thinking tasks—use open-ended problems allowing students to draw on prior knowledge rather than mimic demonstrated procedures; (2) Form visibly random groups frequently—regularly shuffle groups through transparently random processes (e.g., drawing cards) to disrupt ability-based grouping dynamics; (3) Use vertical non-permanent surfaces—have students work at shared whiteboards along the classroom walls rather than at individual desks to promote collaboration and rough-draft thinking. These practices, combined with "de-fronting" the classroom to decenter teacher authority, challenge institutional norms about classroom space, time, and knowledge distribution.

Each participating teacher engaged with BTC practices to varying degrees. While this study does not examine how teachers enacted specific BTC strategies, the framework functioned as a shared conceptual resource that teachers drew upon when articulating their responsibilities. BTC implies a particular purpose for mathematics education—promoting student thinking about mathematical concepts—that resonates with progressive educational values yet stops short of interrogating whose interests' dominant mathematical purposes serve. As such, BTC appeared in

participants' accounts as both a resource enabling certain practices and a framework that, despite its progressive orientation, left fundamental questions about mathematical purpose unresolved.

Data Collection

Interviews

I conducted three semi-structured interviews with each participant over the course of one academic year. These interviews were designed to prompt teachers to share their reflections on the purpose of mathematics education and describe how they understood their pedagogical responsibilities in relation to this purpose. With the exception of Greta, who I met in person for interviews 2 and 3, and Becca, whose first interview was in person, all interviews were conducted via Zoom and lasted 60-90 minutes.

Interview 1. The first interview (see Appendix C), conducted in September and October 2024, explored teachers' contexts and beliefs about what mathematics education is for. I posed questions about their goals as educators and how these aligned—or conflicted—with the priorities of students, administrators, and colleagues. These questions aimed to surface which educational purposes teachers foregrounded, and which remained unspoken. Additionally, probing the relationship between their personal goals and stakeholder expectations revealed sites of tension between what teachers valued and what they felt obligated to prioritize.

This interview also included questions about the resources teachers engaged with to develop their understanding of mathematics education's purposes—including professional development materials, colleague relationships, and conceptual frameworks that shaped their thinking. I designed a follow-up survey (see Appendix D) asking participants to map their

networks of support in greater detail, identifying specific material and social resources and describing how these influenced their pedagogical commitments. The intention was to use this data to generate maps of their egocentric support networks (L. Anderson, 2010; Daly, 2010) for further analysis. However, teachers provided limited elaboration during interviews about their resource engagement, and survey response rates were low. Given this limited engagement, I made the methodological decision to shift subsequent interviews' focus from resource networks toward teachers' direct experiences of uncertainty and tension in navigating responsibilities. Nevertheless, when teachers did reference specific resources—particularly *Building Thinking Classrooms* (Liljedahl, 2020), professional development programs, or colleague relationships—I attended to how these shaped their understanding of their responsibilities and what purposes felt legitimate or achievable.

Interview 2. The second interview, conducted in February and March 2025, was tailored to each participant based on their initial responses. I asked follow-up questions to clarify earlier statements and probe tensions more deeply. In some cases, I shared direct quotes from Interview 1, inviting teachers to reflect on and expand upon their previous thinking.

At the outset of these conversations, I explained how my research focus had evolved—moving from resources teachers engaged with toward their experiences of uncertainty in navigating responsibilities. This transparency served dual purposes: it invited participants into my analytic process and clarified the kind of information I was seeking—specific moments of doubt or conflict that would illuminate how teachers made sense of competing obligations.

Interview 3. The final interviews, conducted between June and August 2025, coincided with a transitional period. Most participants were planning for the upcoming year or had already begun teaching new students, allowing me to explore how their goals and priorities had shifted. Julie, notably, had transitioned into an administrative role and reflected on mentoring newly hired mathematics teachers.

This interview departed structurally from the previous two. Having completed preliminary analysis, I had identified themes related to teachers' responsibilities, how they described and prioritized them, and the tensions they experienced. Interview 3 became an opportunity for collaborative interpretation: I presented 19 responsibility statements derived from across all interviews (see Appendix F) and asked participants to engage with them through an interactive sorting activity.

Participants received the list in advance for reflection. During the interview, using an online whiteboard (Figma), I asked them to arrange virtual Post-it notes representing each responsibility along a vertical axis responding to: "To what extent do you feel it is your personal responsibility to…?" (ranging from highest to lowest, with neutral at center). I chose "personal responsibility" deliberately to avoid debates about what counted as "pedagogical" and because all items related directly to teaching practices. Before sorting, I asked each participant what "personal responsibility" meant to them, ensuring shared understanding.

I emphasized that my interest lay not in the rankings themselves but in their reasoning—how they made decisions, what connections they drew between responsibilities, and where they experienced difficulty choosing. After this initial sort, I introduced a horizontal axis (internally

valued ↔ externally valued) and asked participants to adjust placements accordingly. This proved challenging; most responsibilities felt simultaneously internal and external. Yet teachers' articulation of this difficulty revealed how they distinguished between obligations imposed upon them and commitments they personally held.

In analyzing this data, I found too much variability in how participants interpreted the task to treat the visual arrangements as findings. Instead, the interview transcripts became the data—particularly participants' explanations of their choices and responses to my follow-up questions about groupings and tensions. In this way, Interview 3 functioned as a form of member checking, allowing me to test preliminary interpretations against teachers' own sense-making and adjust my analysis accordingly.

Additional data sources

Given participants' geographic dispersion, systematic classroom observations were not feasible. While I initially planned to supplement interviews with curricular materials, recordings of teacher collaboration, and written reflections, these additional sources proved difficult to obtain. However, two types of supplementary data informed my analysis.

Observation. Greta's local proximity enabled one classroom observation at Sparrow Lake. This observation focused solely on understanding her teaching context rather than collecting student data. Given Sparrow Lake's unique progressive structure, observing the physical and temporal environment clarified how school design afforded flexibility for student-centered instruction and collaborative teaching. Before students arrived, I documented the classroom setup—decorations, desk arrangements, available resources—while Greta explained

the intentions behind these choices. During the mathematics lesson, I observed her questioning strategies, how she communicated expectations, and her organization of materials and content. This observation provided contextual grounding for understanding tensions Greta described in interviews between her progressive commitments and external pressures around content coverage.

Artifacts. *Building Thinking Classrooms* (Liljedahl, 2020) served as the primary artifact, given that all four participants independently identified it as shaping their practice. Reviewing this framework allowed me to understand how BTC positioned teachers' responsibilities and where tensions emerged between its stated objectives—promoting student thinking—and other educational purposes participants navigated. I also consulted school websites and online resources participants referenced for contextual clarification, though these played a less central analytical role than BTC.

Researcher-participant relationship

Establishing trust with participants required transparency about my background, the project's intentions, and opportunities for reciprocity. I shared information about the study's goals and my own purposes in conducting this research (see Appendix C) so that teachers could determine whether our aims aligned. During initial communications and the first interview, I discussed what each of us hoped to gain from participation, ensuring that my research agenda was clear and that we could negotiate how to accommodate each other's goals where possible.

To foster reciprocity, I offered to provide support through reviewing instructional materials, serving as a sounding board for lesson planning, and sharing relevant resources. I also

proposed facilitating a collaborative space where participating teachers could engage in continued dialogue with one another. In practice, geographic distance and scheduling constraints—compounded by teachers' already demanding workloads—limited the extent to which these supports materialized. While some participants engaged with these offers occasionally, the researcher-participant relationship functioned primarily through the interview process itself rather than through ongoing collaboration.

Nevertheless, I maintained ethical commitments to transparency and respect throughout data collection. I framed my role explicitly as seeking to understand teachers' experiences rather than evaluate their practice—a distinction that proved important given the vulnerability teachers displayed when sharing moments of uncertainty and self-doubt. After completing preliminary analysis, I shared findings with participants and invited their feedback as a form of member checking (Creswell, 2007). This allowed participants to confirm, challenge, or extend my interpretations, ensuring that my analysis reflected their experiences with fidelity.

The richness of interview data suggests that despite limited opportunities for co-research partnership, participants felt comfortable sharing substantive reflections on tensions they navigated. Their willingness to articulate moments of doubt, describe competing obligations candidly, and question their own practice indicates that the interviews themselves created space for meaningful dialogue. While my initial vision for collaborative inquiry did not fully materialize, the depth of teachers' engagement with research questions suggests that the relationships established were sufficient to generate trustworthy insights into their sensemaking processes.

Data Analysis

My analysis sought to answer two research questions: (1) How do teachers describe their pedagogical responsibilities? (2) How do teachers experience their varied pedagogical responsibilities? Consistent with case study methodology's emphasis on developing in-depth understanding of phenomena within context (Creswell, 2007; Yin, 2009), my analytical approach was iterative and recursive, moving between inductive and theory-informed strategies. I did not adhere to a single methodological tradition but rather drew on complementary analytical approaches appropriate to my theoretical framework and research questions. This flexibility allowed me to engage with methods consistent with the theoretical perspectives situating this work—sensemaking theory, identity work, and critical attention to emotion and race—while remaining responsive to the data I collected.

My analysis proceeded in two primary modes, each addressing different dimensions of the research questions. Thematic coding revealed *what* responsibilities teachers described, how they prioritized them, and what resources shaped their understanding of obligations. Narrative analysis illuminated *how* teachers experienced navigating competing responsibilities—the temporal, emotional, and identity-based dimensions that thematic patterns alone could not capture. Together, these complementary strategies enabled me to develop both individual case portraits honoring each teacher's situated sensemaking and cross-case insights about broader patterns in how teachers navigate pedagogical responsibilities within uneven resource landscapes.

Thematic Coding

Thematic coding proceeded iteratively across three interview rounds, with my analytical focus evolving as patterns emerged. I began with open coding to identify themes related to mathematical purpose, then narrowed to examine pedagogical responsibilities specifically, and attended throughout to the resources shaping teachers' understanding of their obligations. The following subsections describe this progression.

Mathematical purpose

Initially, after conducting the first interviews, I employed open coding (Saldaña, 2021) to identify emerging themes and patterns in the interview transcripts. From an interpretive perspective focused on meaning-making (Maxwell, 2013), I explored how participants constructed understandings of what mathematics education should accomplish within their specific institutional contexts. This initial coding addressed my preliminary research questions examining how mathematics teachers conceptualized mathematics education and what resources they drew upon to make sense of their work.

This process involved examining the metaphors they used to describe mathematical practices and meaning-making—such as “gym class for the brain” (Carlos) and “a language” (Julie)—and how they connected mathematical ways of thinking to lived experiences. For instance, several teachers described logical reasoning as crucial for interpreting information and making decisions beyond mathematics class. Following the initial categorization of these conceptions, I distinguished between how teachers discussed mathematics as a discipline—its practices and ways of thinking—and how they described the purposes of mathematics education

as an institutionalized endeavor shaped by specific goals, standards, and stakeholder expectations. While these categories often overlapped, teachers sometimes drew distinctions between what mathematics is and what mathematics education should accomplish. This coding process revealed tensions in how these purposes were juxtaposed and how participants positioned themselves in relation to competing conceptions.

Pedagogical Responsibilities

After initial coding and returning to the literature, I recognized that teachers' discussions of purpose were inseparable from their sense of obligation—what they felt they should do. Horn's (2020) concept of pedagogical responsibility provided a conceptual lens for understanding how teachers discussed purpose in ways that revealed both ethical values and institutional obligations. Critically, Horn's framework positioned pedagogical responsibility as something that shapes how teachers make sense of their practice (their pedagogical reasoning)—but I became interested in how responsibility itself is an object of sensemaking when obligations compete or contradict.

While research on teacher sensemaking often employs interactional analysis to examine how teachers collaboratively negotiate meaning in real time (Chen et al., 2021; Horn & Little, 2010), my analytical focus centered on understanding how individual teachers made sense of their pedagogical responsibilities as interpretive work. My interview-based data afforded insight into what teachers were making sense of—the content, ambiguities, and contradictions within their accounts of their responsibilities—rather than the moment-by-moment interactional processes through which collective sensemaking occurs. Through thematic analysis, I identified

how teachers described their responsibilities, what uncertainties they articulated, and where contradictions emerged between competing obligations. This approach revealed that pedagogical responsibility was not a stable framework teachers applied but something they actively and continually interpreted—an object requiring sensemaking precisely because its demands were multiple, conflicting, and context-dependent.

Revisiting the data, I added and adjusted codes while writing analytic memos that expanded upon previous themes. I now attended not just to how teachers understood mathematics and mathematics education, but how they understood their roles and responsibilities in relation to these purposes. This iterative process generated codes related to relational versus instructional responsibilities, "keeping doors open" for students' futures, navigating uncertainty, the resources teachers drew upon, and the emotional dimensions of responsibility. Throughout this iteration, I created concept maps and visual representations to capture connections teachers drew between ethical values and institutional obligations. Figure 3 offers an example of a concept map I created for one participant, Becca, illustrating how she connected relational and instructional responsibilities and the rationales underlying her prioritization decisions. Through creating this map, I noticed how her rationale for her stated responsibilities often centered or drew on test-based outcomes despite that she devalued the significance of the test herself. However, rather than this demonstrating that she was unwittingly prioritizing test-based outcomes, the series of connections that she expressed between her personal values and externally demanded responsibilities allowed me to better understand how she used the framing

of test-based outcomes in order to strategically justify her own decisions as securing both test-driven expectations and her own pedagogical values.

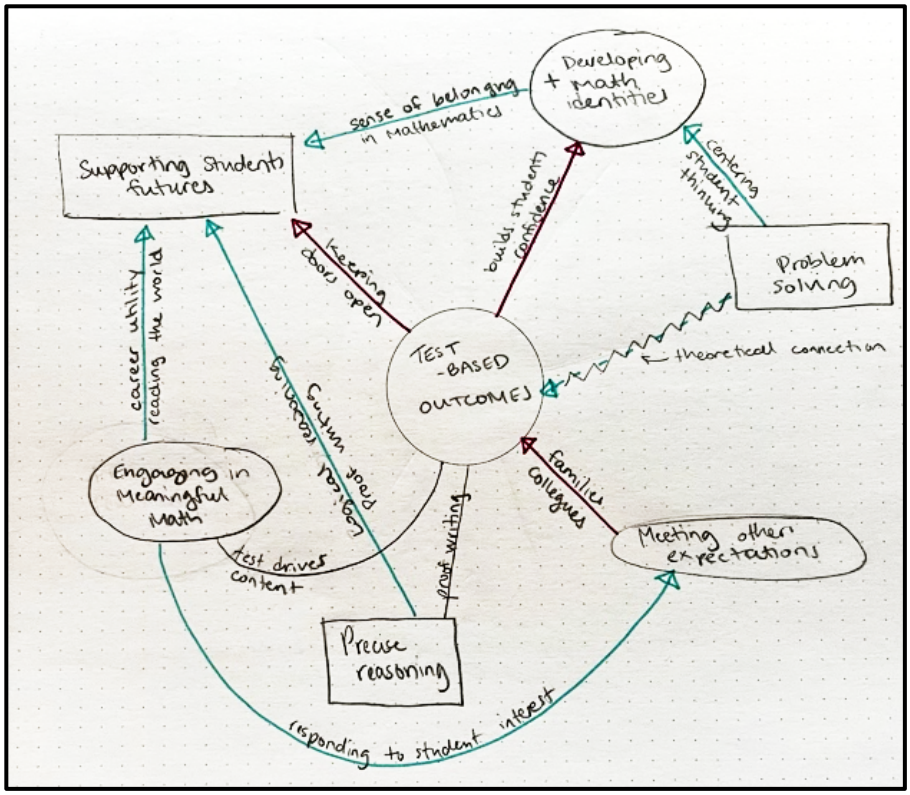

Figure 3: Concept map of Becca's responsibilities and the connections between them.
The arrows indicate directionality showing that one responsibility is seen as influencing another (e.g., test-based outcomes keep doors open thus supporting students' futures). Arrows are different colors to show differences between connections that Becca describes as personally felt versus those that external expectations.

After reviewing all of the primary interview transcripts, I wrote memos noting instances needing clarification, documenting my initial assumptions about connections teachers were making, and flagging surprising patterns that warranted follow-up in subsequent interviews. Based on these initial codes and memos, I prepared questions for the second round of interviews that sought clarification on ambiguous points and probed tensions more deeply. After conducting

these interviews, I began another round of coding, now focusing explicitly on the pedagogical responsibility themes that had emerged. This stage provided richer context for how teachers connected different responsibilities, revealed additional tensions and uncertainties, and illuminated the emotional stances teachers adopted toward particular obligations. Together, the codes from the first two interviews generated the list of 19 responsibilities (see Appendix F) that I shared with teachers in preparation for our third interviews.

As detailed in the data collection section, the third interviews involved asking participants to sort these responsibilities based on the extent to which they felt personally responsible for each. Rather than producing clear rankings, teachers often grouped responsibilities according to the associations they drew between them. These groupings aligned loosely with what I had categorized as instructional and relational responsibilities—the former concerned with content coverage and mathematical practices they felt responsible for developing, the latter with students' identities and affective experiences. However, variations in how teachers grouped responsibilities revealed differences in how they understood connections between them. For instance, Becca created three clusters: one representing belonging and access, another specific to students' mathematical identities, and a third addressing what it means to do mathematics. Julie, in contrast, combined responsibilities related to belonging and students' mathematical identities into a single category, separating these from mathematical reasoning skills. While these grouping patterns offered some insight, too much variability existed in how participants interpreted the task to analyze these visual arrangements as meaningful data. Instead, my analysis focused on the reflections teachers articulated while sorting—their reasoning about

why certain responsibilities felt urgent or conflicted, what connections they drew, and where they experienced difficulty deciding.

Thematic analysis of the third interviews corroborated initial themes while adding nuance based on participants' reflections and language adjustments. Moreover, teachers' responses to the task of organizing responsibilities based on external and internal motivations provided additional insight into how they understood these responsibilities as self-motivated values versus externally mandated obligations—a distinction that proved important for understanding how resource infrastructures shaped their sense of what was possible.

Resources shaping responsibilities

Consistent with the theoretical perspectives developed in Chapter Three, my analysis of resources was oriented not toward mapping teachers' resource networks comprehensively but toward understanding how resources functioned within teachers' experience of their responsibilities—whether they expanded interpretive possibilities or constrained them, whether they sustained teachers' moral commitments or deepened self-doubt, and whether they helped teachers recognize structural contradictions as real or framed impossible binds as implementation failures. This orientation follows Horn et al.'s (2025) argument that what matters analytically is not which resources teachers access but the conditions under which they encounter them—specifically whether those conditions support the relational agency that enables teachers to engage critically with resources rather than consuming them passively.

During thematic coding, I first identified the resources teachers referenced across interviews, coding for social resources, such as colleague relationships, professional learning

communities, mentorship; material resources, such as curriculum materials, instructional frameworks, assessment tools; and conceptual resources, such as theoretical frameworks, pedagogical philosophies, research-based practices. However, consistent with Louie's (2017) and Horn's (2005) argument that resources function within social and material infrastructures rather than independently, I looked beyond the resources themselves for analytic significance. I examined how teachers narrated their relationship to these resources—specifically, how they positioned resources in relation to their responsibilities, their uncertainties, and their sense of themselves as educators. I coded for instances where teachers described resources as framing their sense of what good teaching required, as validating or challenging their pedagogical choices, as sources of confidence or self-doubt, and as opening or foreclosing interpretive possibilities.

This approach allowed me to attend to the experiential dimensions of resource use that a network mapping approach would not have captured. For example, Becca's repeated references to her professional learning community revealed not just that she had access to progressive pedagogical resources, but that the collaborative infrastructure of that community allowed her to engage critically with those resources—to recognize when frameworks contradicted each other and to interpret that multiplicity as evidence of structural complexity rather than personal confusion. In contrast, Julie's engagement with similar resources—including *Building Thinking Classrooms*, which all four teachers referenced independently—revealed a different experiential pattern: without colleagues to help her interrogate the premises of those frameworks, their built-in explanatory logic became the primary lens through which she interpreted her difficulties,

directing her interpretive work inward rather than toward the structural conditions shaping her practice.

I also coded for absent resources—moments when teachers described wanting to support students in particular ways but lacking the materials, relationships, or institutional support to do so. These absences were analytically significant not as gaps in teachers' knowledge or access but as evidence of how resource infrastructures shaped what responsibilities felt achievable, legitimate, and worth investing in. Carlos's frustration with colleagues who attributed student disengagement to student deficiency, for instance, revealed how the absence of shared commitments constrained not just his practice but his capacity to sustain moral investment in contexts where his interpretations found no relational confirmation.

While this analysis was less comprehensive than my original research design, the reorientation toward teachers' experiential narratives of resources proved more consonant with my theoretical framework and research questions. Resources did not determine teachers' sense of responsibility, but attending to how teachers narrated their relationship to resources illuminated the context-dependent conditions under which competing responsibilities felt navigable or overwhelming—a finding that became central to the discussion in Chapter Six.

Narrative and Poetic Inquiry

While thematic coding across all three interviews revealed what responsibilities teachers named and how they described them, this approach flattened the complexity of how teachers actually experienced navigating competing responsibilities in situated, temporal, and emotional ways. Thematic codes captured patterns but obscured contradictions—moments when teachers'

stories revealed tensions that their direct statements did not. This recognition prompted me to complement thematic analysis with narrative methods, which offered tools for attending to the stories teachers told and what these stories revealed about their lived experience of pedagogical responsibility. Further analysis—and encouragement from my advisor, Dr. Nicole Louie—led me to employ poetic inquiry as a representational strategy to highlight emotional tensions and identity binds through creative synthesis. These methods are chosen not only for their analytical affordances but because they honor the complexity of teachers' inner lives in ways that more extractive research approaches do not.

Stories as experience

Narrative analysis has been widely used in mathematics education research to examine how teachers construct and reconstruct their professional identities and interpret social phenomena within context (Chen et al., 2021; De Freitas, 2004; Helliwell & Ng, 2022; Lopes & D'Ambrosio, 2016; Philip et al., 2019; Skovsmose et al., 2023). These studies demonstrate that narratives reveal how individuals grapple with tensions as they make sense of their experiences and, in confronting teaching's inherent uncertainties, come to re-narrate (Philip, 2019) their interpretations in light of new framings and context-based experiences. Narrative analysis—using interview transcripts (Lopes & D'Ambrosio, 2016), collaborative storytelling (Chen et al., 2021), and reflective assignments (Philip, 2019)—captures instances of teachers both challenging and reinforcing dominant ideologies in their interpretations of events and framings of their identities. As Chen and colleagues (2021) note, "examining teachers' stories as evidence of their pedagogical reasoning reveals both their existing assumptions and aspirations about

pedagogical responsibility and other elements of teaching practice" (p. 381). Much of this research combines conversational and narrative analysis to attend to how narratives are co-constructed through interactions (Chen et al., 2021; Helliwell & Ng, 2022; Lopes & D'Ambrosio, 2016; Skovsmose et al., 2023). This body of work establishes narrative analysis as particularly useful for understanding the complex dynamics between teachers' agentic role in their sensemaking and the influence of dominant structures shaping their interpretation of their practice.

As a methodology, narrative inquiry (Connelly & Clandinin, 1990) typically employs narrative interviews and field observations designed from the outset to capture how participants experience a particular phenomenon. My approach differed: having collected data primarily through semi-structured interviews focused on pedagogical responsibilities, I turned to narrative inquiry methods after data collection to examine the stories teachers spontaneously drew upon during our conversations. I revisited all transcripts attending specifically to the stories teachers told and how, through these stories, they conveyed their experience of pedagogical responsibilities in ways that went beyond their direct descriptions.

I was guided by Connelly and Clandinin's (1990) three-dimensional narrative inquiry space: temporality, how past, present, and future are all at play in one's experience; sociality, the social context of experience and how it is co-constructed through interaction; and place, the physical environment shaping the experience. These dimensions helped reveal how teachers' experience of their responsibilities was reinforced socially or contradicted in practice. I noted how teachers invoked past experiences or painted pictures of possible futures to convey their

beliefs and responsibilities while maintaining their experiences' complexity. I attended to the analogies they used, the characters they positioned in their stories, and the contradictions that emerged between different narrative moments.

First, I identified narrative instances within each interview. I distinguished narratives from other responses as moments when participants shared specific past events to clarify a response, described generalizations about their interactions with key stakeholders indicating what experiences they understood as relevant, or offered hypothetical scenarios to elaborate their perspectives. In other words, these were instances that did not represent direct answers to questions asked but rather stood as representations of experience through story.

This analysis revealed important distinctions in the kinds of stories participants frequently drew upon, which illuminated how teachers relied on different resources, experienced emotions differently, and understood themselves distinctly as they navigated tensions. For example, Julie frequently told stories about specific interactions with individual students—moments that exemplified key decision points about which responsibility to prioritize and why. Becca, in contrast, narrated interactions with colleagues, mentors, and parents, positioning some as resources offering support and reassurance while others directly challenged her pedagogical commitments. These interactions became occasions for Becca to reflect on her beliefs and the kind of teacher she wanted to be. Carlos drew on stories about his own educational history and cultural identity to explain his relationship with students, while Greta told stories that situated her practice within larger educational debates—contrasting progressive pedagogy against

mainstream expectations about content coverage and acceleration to position her approach as philosophically grounded rather than circumstantial.

Attending to the different characters and contexts within each teacher's stories, and how teachers positioned themselves within these narratives, provided a more complex understanding of how emotions and identity shaped their navigation of responsibility. Stories revealed what teachers noticed as salient to their work, who and what they positioned as threats or resources, and how they made sense of contradictions between what they valued and what felt possible. This narrative dimension complemented thematic coding by showing not just what responsibilities mattered but how teachers experienced them as conflicting, urgent, or sustainable in particular moments.

Poetic inquiry

Poetic inquiry remains relatively uncommon in mathematics education research, yet guidance from my advisor, Dr. Louie, led me toward poetry as both an analytical and representational tool. Skeptical at first—I was not practiced in writing poetry—I hesitantly experimented by writing a poem based on Becca's interview transcripts:

> *Who am I to say?*
> How a score on a test comes to define your success
> What numbers and patterns matter to your future
> *Who am I to say?*
> That my wishes for you are more expansive than your own, than your family's
> And your belonging depends on more than can be captured on paper
> *"Who am I to say?"*

This initial attempt unveiled poetry's analytical potential. The process of distilling Becca's experience into poetic form compelled me to identify the core emotional and ideological tensions driving her pedagogical responsibility. The poem above was loosely crafted based on my interpretation of the tensions teachers were experiencing and how those tensions manifested in their language. In writing each poem, I wrote and revised lines that captured my interpretation of each teacher's experience without requiring myself to use their precise language or represent every detail. I attended to patterns in their word choice, recurring metaphors, and emotional tenor. While I used their words and descriptions as starting points, I authored the poems and invited participants to read them and share their responses as a form of member checking. Later, as I delved deeper into my findings and familiarized myself with poetic inquiry processes, I revisited these poems, using them as an opportunity to revisit the data. I employed poetic transcription (Glesne, 1997) to reconstruct these poetic representations in participants' own words. What began as representational experimentation evolved into a mode of analysis itself.

My approach to crafting these new poems, included in Chapter 6, began with a statement or question that resonated with the participant's experience of uncertainty or tension. For instance, in Greta's case, I selected a statement she had repeatedly referenced, which simultaneously conveyed a contradiction she was experiencing: "Everything matters. Nothing Matters." For Becca and Julie, I chose statements that reflected their experienced uncertainty through their self-questioning language, such as "Who am I to say?" and "Is this a me problem?" These statements were articulated in the context of feeling the need to fulfill certain responsibilities that competed for their time, resources, or legitimacy. Carlos's poem centered

around survival, a recurring theme during our later interviews, and how he employed the language of survival to frame his choices. My selection of the focal points for these poems was subjectively influenced by my own research questions and the participants' words. Subsequently, I expanded beyond the individual statements or ideas that inspired the poems to delve deeper into the context of these statements and uncover the underlying experiences they revealed.

For Becca, her question "Who am I to say?" offered an entry point for exploring themes of authority, racial positioning, and uncertainty. Furthermore, the context of the question surrounded a key tension in how she experienced her responsibilities: What did it mean for students to have a sense of belonging and from whose perspective? In re-examining the transcripts with Becca's question in mind, I asked; Why is she questioning herself in this instance? What makes her doubt her legitimacy to define success differently than families do?

To respond, I first examined the immediate context of the quote—a conversation about parents questioning her pedagogical approach. Then, I broadened my perspective to consider other factors that might influence her self-questioning. I reviewed other moments during our conversations when this tension, between her own ideas about what it meant for students to belong in mathematics and differing opinions, surfaced. By doing so, I aimed to identify the factors that shape her experience of this tension: her White identity as a teacher of predominantly Black and Brown girls, her desire to be responsive to the values of her students and their community, her identity as a teacher who cares deeply about student sensemaking. The poem condensed multiple dimensions into a form that highlighted the recursive nature of her question

and what was at stake: not just pedagogical choice, but whose voice carries authority in defining students' mathematical futures.

I followed a similar process with each participant, though the focal tensions differed. Julie's poem, inspired by her question "Is this a me problem?", centered on the self-doubt and uncertainty she expressed between wanting to support all students' mathematical success and questioning whether her approach perpetuated harmful labels about ability. Her wondering whether structural contradictions were personal failings became the poem's through-line. I also structured the lines of Julie's poem similarly to Becca's—shifting the position of the words between left, middle, and right, to mirror the ways that they were experiencing being pulled in different directions. Carlos's poem took a different form. Broken into three separate but related instances, his poems surround his feelings toward his experience teaching Finance Math. The three poems mark both temporal shifts alongside directional shifts—from an individual problem to a structural condition. His positioning himself as both complicit in and resistant to a system that sorted students became the poem's tension. Greta's statement, "I know when I say that it might sound irresponsible," captivated me from the moment she said it. Who was the audience of this claim? While directed to me, she seemed to be addressing an unspecified authority with power to determine what counted as (ir)responsible teaching. Revisiting her transcripts, I noticed how Greta interspersed expansive, humanizing descriptions of her teaching philosophy with qualifying statements revealing how dominant narratives pervaded even her autonomous context. In her case, rather than the words showing how Greta's language mirrored shifts in her experience, the juxtaposition of large and small text reflects how these qualifying statements

functioned less as consequential uncertainties and more as rhetorical asides meant to show the breadth of aims she was considering. With each case, I sifted through the data, looking for metaphor, narrative, and affect through a reflexive process. This process followed Prendergast's (2009) articulation of sifting "in that the researcher is interconnected with the researched, that the researcher's own affective response to the process informs it" (p. 547).

The poems distill rather than summarize—they foreground particular dimensions (identity binds, emotional stakes, contradictions) that narrative summaries might flatten. As Feldman (2010) writes, "poetic representation, when combined with more conventional techniques of qualitative research, may enrich and deepen understanding of the writer as well as the reader" (p. 388). The poems function as both analytical products—evidence of my interpretive process—and representational tools that invite readers into the affective complexity of teachers' navigation.

These poems, rather than directly representing participants' experiences as they described them, depict my interpretation shaped by prolonged engagement with their accounts (Prendergast, 2009). In many ways, these poems functioned as analytical memos that crystallized my interpretations while also becoming structural devices in my findings chapters. By opening each teacher's case with a poem, I invite readers to encounter the emotional and ideological tensions first—priming attention to uncertainty and contradiction before presenting the detailed analysis that follows.

AI as a writing tool

The writing of this dissertation involved the use of Claude, an AI language model developed by Anthropic. The analytical decisions in this work are my own. I only began using Claude after conducting my own analysis of the data and memo. I also did any further analyses, including the poetic inquiry phase, on my own. This was important, I felt, to maintain a personal closeness to the participants' stories and experiences and ensure that I had a thorough understanding of the data against which I could judge any of Claude's suggestions. Claude was used as a tool to brainstorm ideas, generate chapter outlines, offer critical suggestions, and revise writing for clarity and flow. I have addressed the fuller details alongside my ethical reflection regarding my use of AI in Appendix G. I name it here as a methodological transparency matter—because how a dissertation is written is part of how it was produced, and that deserves honest accounting alongside the other methodological decisions described in this chapter.

Chapter 5

Findings Part 1:

How teachers describe their pedagogical responsibilities

The four teachers in this study—Carlos, Becca, Julie, and Greta—worked in vastly different contexts (see Figure 2 for overview of teachers and school contexts). Carlos taught at a Title 1 public high school in the Southwest with a large Hispanic student population and tracked mathematics classes. Becca taught at a public girls' academy in a large northeastern city with significant testing pressures. Julie taught at a small charter school with an "IB for All" curricular mission. Greta taught at a small progressive private school with near-total curricular autonomy. Despite these different contexts, all four teachers drew on similar purposes when describing their responsibilities, though they emphasized these purposes differently and experienced different constraints in enacting them.

This section presents how teachers described their pedagogical responsibilities, organized around two primary categories of responsibilities that they named as important: 1) relational responsibilities and 2) instructional responsibilities. As will become evident, these responsibilities were rooted in contrasting conceptions of *what education is for*—the purposes they are meant to serve. Teachers vacillated between two purposes that frequently contradicted one another while constructing responsibilities that attempted to find common ground between them. On the one hand, they felt that mathematics education should develop students as sensemakers and critical thinkers, naming the habits of thinking and reasoning that mathematics could foster beyond the specific skills and procedures they were assessed on. On the other hand,

they recognized the gatekeeping role of mathematics and that there were particular content and skills they were responsible for teaching in order to pave the way for students' future opportunities. In Part 1, I focus on describing the responsibilities that teachers named and showing how these responsibilities drew on different narratives about educational purposes.

Relational Responsibilities

It is commonly understood that teaching is a relational practice. It involves fostering healthy relationships with and between students to create a learning environment where all students feel safe and secure in their learning. Each teacher interviewed spoke in detail about the importance of cultivating these relationships and explained how they mattered to mathematics learning in particular. Understanding mathematics as a gatekeeper and a subject that bolsters academic anxieties, they often viewed relational work as more important than the mathematical content that they covered. These relational responsibilities included establishing trust and safety, building community, and developing positive relationships with mathematics. Through these relational responsibilities, these teachers saw themselves as challenging ideas of mathematics as an exclusive space and empowering students as mathematical sensemakers. They felt that they could not do their job as teachers if they did not first attend to students' humanity.

Establishing trust and safety

To develop positive relationships with mathematics, "trust" was frequently named as critical to teachers' responsibilities. All of the participants felt that it was important for their students to experience growth that was not based on finding correct answers. This sense of trust from their students was described as a precursor for students to be engaged in the class and to

work through complex problems. Because these teachers were using practices that prompted students to think through new problems without being told what to do, their students needed to trust that they could work at their own pace and get questions wrong. At the same time, establishing that trust with students remained an ongoing challenge.

Carlos often experienced a lack of trust from students and described it as his responsibility to challenge that mindset. Students either did not trust themselves to engage with challenging mathematical problems or did not trust that their teacher would give them the space, time, and support that they needed to make sense of mathematics. Carlos stated that he is responsible for making sure that his students trusted that he believed that they are capable of mathematical sensemaking. As a high school mathematics teacher working with students with IEPs (in the class he refers to as "resource Geometry"), he noticed tendencies for students to come in with a negative attitude towards mathematics. As he described, the Sophomores he taught felt that because they were in a "resource" class, there was little point in trying, and they often started the class less willing to engage with unfamiliar problems. By not wavering on his expectations that students will complete their work and engage in challenging problems, he showed his students that he believed in their mathematical abilities in ways that they did not always experience elsewhere.

Part of what drove Carlos' motivation to make sure students felt capable in his class was how he saw them positioned compared to other students and his own relation to them and their community. He was born and raised in Mexico, he speaks Spanish, his skin is brown, and teaching in the Southwest U.S., many of his students share these characteristics. The

responsibility that Carlos felt to make sure his students feel trusted stems in large part from how he sees himself as a role model for them. He has seen how, in his own school, his students are marginalized within mathematics. At one point, he pointed out to his department lead how the last names and demographics of students in his finance class, "the easiest math class," compared to those in Calculus. For similar reasons, he was discouraged by the tendency of other teachers to complain about students and not give them enough credit.

As another example, Becca discussed a book she had recently read as part of a professional development book club, *Rethinking Disability and Mathematics* by Rachel Lambert (2024). One of the things that stood out to her was how the author discussed teachers' use of wait time, not just as a technical skill but as a requiring a shift in mindset. As Becca described it, Lambert (2024) highlighted the distinct experiential difference between two teachers. One teacher posed a question with a "palpable sense of anxiety," indicating an upcoming transition to the next question. In contrast, the other teacher adopted a more relaxed approach, conveying sincerity in their intention to wait for students' responses. From this description, Becca clarified her understanding of her responsibility to believe in her students' ability to answer questions. This responsibility encompassed not only employing practices like wait time to foster student thinking but also reflecting on how her belief in students' ability to respond was conveyed through her tone and the speed at which she posed subsequent questions. Becca recognized that when she asked a question and her students didn't respond immediately, she often wondered if they understood her question or if she had made an excessive leap. She would second-guess herself, questioning whether she was doing something wrong. Her reading of Lambert shifted her

interpretation of her own anxieties, from being less about asking the wrong question to instead reflecting a lack of trust in students' ability to answer the question. This reflection revealed a sense of responsibility she felt toward conveying trust in her students mathematical capabilities through small shifts in tone and intention.

In other instances, teachers described how students' experiences of failure and frustration resulted in students' believing that a teacher had failed them or that they were not learning what they expected to learn. Building trust early on was thus necessary for students to recognize the teacher's intentions to support their learning through allowing them to experience failure in a safe environment. For example, Julie felt a sense of responsibility toward students developing confidence in their mathematical abilities while learning from failure. In order for students to be able to work through complex problems they need to feel comfortable experimenting and taking risks. As an example, with her 9th grade students she intentionally taught mathematical approaches that include "practicing failing well." As Julie described, she wanted her classroom to be a place "where they can come and feel like, oh, failing is fun. It's like a trampoline park where we come here to fall down, and that's a good feeling, and I feel safe in this place." She intentionally built in opportunities for students to practice failing while ensuring that they always felt supported and cheered on by her and their community.

Trust was also described as important for students to develop agency in their learning. It is common in all of the subjects that Greta teaches, including mathematics, for students to decide when they feel that a project is complete or to find the resources, they need to answer a question that interests them. Not always easy, it was nonetheless a responsibility that she felt toward

developing students' sense of self so that they may understand who they are as learners and be able to advocate for their needs when they move on to high school. To do this well, students had to trust that Greta would create space for them to develop this understanding as opposed to simply teaching them how they are supposed to be. Without this trust, students may continue believing that they're not good at math because they are not living up to expectations for their mathematical achievements.

Building a sense of belonging and community

Similar to establishing trust, teachers wanted their students to feel like they belonged in mathematics. Whether or not they chose to continue to study mathematics or go into STEM related fields, this sense of belonging was important to participants to make sure that students did not hold themselves back from opportunities to continue pursuing mathematical learning. They wanted students to be able to envision themselves in high-level mathematics courses, which meant experiencing math class as a place where they did not feel the need to compare themselves to their peers.

To Becca, fostering students' sense of belonging meant challenging discourses of mathematics success as an individual pursuit to develop students' sense of responsibility toward each other's learning. It also meant helping students build a sense of confidence in their own mathematical abilities beyond what is measured by formal tests. One way she recognized that she might do this is by bringing in speakers or highlighting individuals that students can identify with that are working in STEM fields but doing so felt "outside [her] capacity." She also made attempts to get her students into math competitions and programs but had "never quite gotten it

off the ground." While these kinds of activities could certainly be beneficial to promote student belonging in mathematics, Becca shared that the day-to-day belonging-centered instruction that she did in her classroom was more important to her: "I think there's a lot of little, all those sort of extra things we could do, but I think at its core, if I don't feel like I belong in just my math class day to day, I'm probably not going to ever envision myself at a higher level, even if this one role model or speaker comes in."

Becca instead focused her instructional practices on building a strong mathematical community where students felt responsible for one another's learning. Students were regularly asked to share their thinking with one another in public ways (e.g., on whiteboards placed around the room) to contrast ideas that mathematics is an individual activity. And by using randomized grouping, Becca aimed to limit opportunities for students to compare themselves to their peers based on the idea that, with randomized groups, kids aren't going to read into their teacher's beliefs and think "'oh they've paired me up with this kid either because we're both struggling or because they want me to learn from this kid so therefore that kid is the smart and I'm not.'" Instead, she says, "when you change groups frequently, your kids can't fall into roles within the group of who's the smart one and who's not."

In fact, randomized grouping was one practice that all teachers named as meaningful to their responsibilities. They credited randomized grouping to Peter Liljedahl's *Building Thinking Classrooms* (BTC; 2020) framework as a way to disrupt students' preconceptions about who is "smart" or "struggling" based on their knowledge about how other teachers have used ability grouping. Not only did teachers describe these randomized groups as a way to build students'

confidence, but also as a way to build community by disrupting practices of comparison and competition. Carlos, for example, summarized building a community as follows,

> **Carlos:** It's important that they're in community with [the] class because I have them work together a lot, and also because I'm only one person, and I can have a class with up to 29 students. And so, if they're comfortable with each other, they can work together and figure stuff out and ask for help from their neighbor. And asking for help is difficult. You're being vulnerable when you ask someone for help. And I feel like them being okay doing that, that's important, and it just helps the class. And also, just knowing that, them being a community, and me kind of counting as part of that community, it's easier to talk about when something is not working for them, or when something needs to be adjusted. No one in my classes is intimidated by me, I don't think, or by any other of the students, at least not that I can see here in class. I feel like that is important; to be able to know that everyone here is on the same team. We're all trying to go to the same place.

By building strong classroom communities, all students could feel as though their thinking mattered and that they had the support from their teacher and their peers to be successful.

Developing positive relationships with mathematics

All four teachers also wanted to challenge students' conceptions about what makes someone "good" at math. When discussing her responsibilities in relation to mathematics, Greta spoke about how mathematics was a gatekeeper and how she wanted "every student to leave feeling like a mathematician, no matter what class they take next year." She was critical of what

she viewed as traditional structures of mathematical achievement, where students were placed in mathematics courses based on skills-based knowledge. Instead, she described mathematics as something that you feel. It is a subject that all children can access as long as they feel they are capable, stating,

> **Greta**: I feel like, in terms of what kids learn, everything matters and nothing matters, right? I'm way more in tune with individuals and what their relationship to math learning is…. It doesn't matter where they're beginning, if they're starting in algebra or if they're starting in pre-calculus their freshman year, that doesn't matter. It's how they feel about that and how they are willing to move forward and grow. That's what I think about more than, what if they don't know this, like whatever, they'll learn it when they have to, right?

To cultivate the feelings she wanted students to have, Greta viewed it as her responsibility to model joy in mathematics, particularly as a role model for the girls in her class stating, “So as a female, from the beginning, even if I didn't love the math that we were doing, I said how much I loved it, just, you know, fake it till you make it or whatever it needs to be. That's a responsibility I think teachers have is to find the joy and live in that joy.” She wanted students to develop positive associations with mathematics and see that they could find it just as enjoyable as other subjects that they preferred.

Other teachers discussed how they cultivated positive relationships by helping students develop an awareness of their learning. For example, Becca shared how students would often view something that they accomplished as something that the teacher did. She would point out to them all the ways that they figured out a problem for themselves to build confidence in their own

understanding. As she put it, “I guess we've realized that unless you remind kids that you're actually not telling them what to do, they just still view it as a teacher getting them through the work, they don't give themselves enough credit”. Other teachers also spoke about this in terms of building students’ confidence in their own mathematical abilities. They would do so by drawing attention to students’ strengths in starting a problem, or making connections, or sharing ideas that were not necessarily connected to having the correct answer. Additionally, they tried to make sure students’ growth was reflected in their grades where possible.

All participants discussed ways that they had adapted traditional grading processes to help students disconnect their learning from stagnant numeric evaluations. They used flexible homework and assessment policies that were designed to help students see their growth in terms of mathematical practices and depth of understanding as opposed to being evaluated purely on mastery. And Greta, uniquely, did not use homework or assessments, considering such evaluative practices to be a barrier to student learning. These policies permitted teachers to meet responsibilities that they felt toward helping students develop confidence in their mathematical abilities and see mathematics as a space in which they could be successful in ways that traditional grading methods did not support.

Overall, teachers spoke in detail about how they felt it was their duty to do everything in their power to help students see themselves as mathematically capable and create an environment that allowed students to engage deeply in mathematics. Each teacher felt that they had a role to play in challenging dominant narratives about who is capable of learning mathematics and what

it means to be successful in mathematics. These were responsibilities that they not only felt toward their students as social and emotional beings, but also toward upending traditional conceptions of mathematics instruction. Without maintaining responsibilities toward relational work, they would not be able to engage students in the mathematical content and practices that it was their responsibility to teach.

Instructional responsibilities

While teachers often described how relational responsibilities were crucial to their pedagogical responsibilities, they also described responsibilities related to the mathematical practices and content that they taught students. As mathematics teachers, they had goals and expectations of what students would learn in their class and what kinds of learning activities they would engage in. As they described, their relational responsibilities were necessary for students to engage in the learning of content, but the content responsibilities also needed to reinforce their relational responsibilities. In many ways, these content responsibilities were not just about students' experience in their classroom but about how teachers imagined students' futures and what they needed to be prepared for. While there relational responsibilities often aligned with broad purposes of education aimed at students' social development, the ways that participants described their instructional responsibilities often fell into two camps of distinct purposes: 1) mathematics education should develop students as sensemakers and critical thinkers, emphasizing habits of mind that mathematics could foster beyond the specific skills and procedures students were assessed on and 2) mathematics functions as a gatekeeper and there are content and skills they are responsible for teaching in order to pave the way for students' future

opportunities. These categories were not always made explicit by teachers nor were they always spoken of separately in ways that suggested conflict. However, I separate them here to note distinct features of why these responsibilities were seen as meaningful.

Developing students as sensemakers

In speaking about what they had the responsibility to teach students, participants all spoke about different habits and life skills that were important in mathematics. These were related to mathematical practices as well as ways of thinking and communicating that were somewhat unique to mathematics. Three that came up regularly were problem-solving, logical and precise reasoning, and sensemaking.

Problem-solving. Teachers described wanting students to develop skills for approaching unfamiliar problems. While they understood some direct instruction as necessary, they prioritized opportunities for students to engage with problems before having a clear idea of how to solve them. Carlos, for example, described mathematics as a "gym class for the brain" more so than as a class to learn technical and career-focused skills. In line with this idea, all of the teachers implemented strategies from *Building Thinking Classrooms* (Liljedahl, 2020) to incorporate "rich thinking tasks" and activities that were designed to prompt students to think through problems without explicit direction from their teacher. Some big ideas from this framework are students spending a lot of the class period doing work at whiteboards (or other VNPS: "vertical non-permanent surfaces") instead of at their desks taking notes; using randomized groups to challenge students' notions about who is smart; and using rich tasks that

prompted students to come up with new strategies and different solutions to interesting problems rather than applying formulaic procedures. As Becca shared,

> I think what I really liked about [Building Thinking Classrooms] was that it felt very much aligned with what I wanted my math classroom to be. Here was somebody talking about things you can do in your classroom to get kids doing real problem-solving and whatnot. If you get them writing on whiteboards, they will be less afraid to make a mistake than if you had them doing stuff on posters or chart paper. It allows kids that sort of trial-and-error process.

Using this framework, Becca did her best to use rich thinking tasks and questioning practices that prompted her students to engage deeply with problems, even when they were not sure how to approach them. On some occasions, she would tell students explicitly that their goal was not to solve a problem but to make connections between this problem and others they had seen before or other concepts that they remembered. By doing so, she hoped to take them out of the mindset that mathematics was about solving problems and into a mindset of mathematics being about developing processes of problem-solving. As she put it, "on a day when it goes well, the teacher can just sit back in the middle of the room and turn and just watch all this math happening around. Watching kids help each other and make connections without a teacher having to spell things out." Like the other participating teachers, who also used BTC, Becca described her responsibility in terms of giving students opportunities to actively solve problems, rather than teaching them how to solve problems.

Carlos too used BTC to help shift students' mindsets about what mathematics looks like and what their role was in the mathematics classroom. Before taking his class, he noticed that students came in viewing mathematics as something taught to them, not something that they actively participated in. He used strategies from BTC that put greater onus on children to engage in mathematical problem solving. These ideas were not always supported by colleagues who questioned whether their students could do that level of work without direct instruction. But as he saw it, these teachers were stuck in an old way of teaching where problem-based tasks were more of an event used infrequently that maybe took a day before going back to their regular teaching where they talked to kids for an hour. He found this frustrating because, to him, it contributed to students' behavior of disengaging from mathematics and feeling insecure in their own thinking. His responsibility was to counteract this mindset by showing students how to actively engage in problem-solving rather than expecting it to be spoon-fed to them.

Other ways that teachers described how they taught problem solving was about helping students develop a toolbox of procedures and mental processes to draw from. For example, Julie described how she supported students in understanding what tools they might need to solve a problem and figure out how to use those tools effectively. In this way, there was room for both memorization-based instruction and process-oriented meaning-making. As she stated, "I honestly think that even that straightforward path, even just the memorizing rules of exponents or rules of logs, has its value because it really is giving kids tools to solve problems, and even if they don't really understand the problems they're solving, they're learning how to manipulate tools or manipulate problems. And I think that has outside value." And for students who felt discouraged

when they are not able to solve the problems in front of them, Julie framed it as a problem of disorganized knowledge: “[they] don't know how to organize their toolbox and understand which tools to try.” Organizing one’s “toolbox” of mathematical concepts was also described as related to other important skills that students would need to use in life. For example, she compared approaching an equation and not knowing how to start to cleaning a messy room. In the same way as you might start by sorting things into easier to manage piles, solving a mathematical problem involves “breaking things down into small pieces and into doable bites, starting with things that make sense.” This was one of the ways Julie emphasized how she wanted to help students to develop skills that they could use to break down problems and overcome feelings of overwhelm when a problem felt too complex.

Logical reasoning. In terms of the use of these mathematical toolboxes, Julie made connections between the kinds of procedures and problem-solving processes that students engage with and how they might apply to their future jobs or college education. In the example below, she connected the content that students learn in high school to potential careers even outside of mathematics.

> **Julie**: For me, I have appreciated just having the tool of algebra to solve some really practical, real-world problems. So, I do think Algebra can be really handy. I think it's exciting when they get into advanced statistics, because I think kids, so many kids, are going to deal with statistics in college. I recently was tutoring a friend who's in a psychology grad school program, and he was taking statistics, and was like even if you want to study psychology, you still have to be able to do a chi squared goodness of fit test, because you need to be able to, or at least understand what that means and how it's

> useful. And so, I think it's got a ton of practical applications, but I do tell kids, you know, you're not going to remember the quadratic formula, nor are you going to need to need to remember it. You'll have, you have computer to do that for you. But it's the thinking, that logical thinking, that I'm really after.

She described this kind of logical thinking as something that was not only important but that she could relate to herself. As she put it, she relied on logical reasoning to process the world and draw conclusions, and she was excited to teach her students these same processes.

Part of this logical reasoning process, as Julie saw it, was learning how to use logical reasoning and communicate understanding mathematically. She described mathematics as a language and positioned herself as a language teacher of sorts, wanting her students to acquire the vocabulary and syntax of mathematics so that they might communicate their understanding of the world. She not only identified this as a necessary goal to support students' graduation requirements, where they need to write a paper about a topic of their choice, but also to support Julie's goal of helping students engage critically with the world around them. She described reasoning and justification as important practices because they support people's ability to make thoughtful decisions and verify information, "from how we consume data from the news or make decisions about what job we're going to take." By having mathematical language in their toolbox, Julie described students as having a greater capacity to verify what they are told to believe and make informed decisions.

Becca also highlighted the importance of students being aware of and able to articulate their reasoning in clear and precise ways, describing a big point of mathematics as being to

develop clarity around your own thinking, “not just to be able to do things, but to know what you know and say how you know it.” She felt this was particularly relevant in Geometry—the course she spent the most time teaching—because it was frequently the only time in high school when students would be exposed to proof writing. Through proof writing, students learned that having a correct answer was not enough to demonstrate their understanding of a concept. They must be able to write their thinking process in words that explain what they know and how they know it. For this reason, Becca wanted to see proof-level writing in all math courses and took steps to incorporate writing structures into other mathematics courses, like pre-calculus. Through engaging in processes of proof and justification, Becca described how students gain greater clarity of their own understanding. In this way, Becca made it clear that one of her responsibilities was to figure out what resources students would need to gain skills of mathematical writing and justification as a means of developing their understanding of mathematical concepts.

For Becca and Julie in particular, they named the kinds of logical and precise reasoning involved in mathematics as important for students as habits they would use throughout their lives. It was not so much about teaching a formal process of writing mathematical proofs or using vocabulary correctly but more about students learning to understand their own thinking and how to communicate that thinking to others. Skills they saw as useful in a variety of circumstances.

Sensemaking. The ideas that teachers named around problem solving and reasoning were connected to how teachers wanted to prepare their students to engage with their worlds as active

sensemakers. These responsibilities were less about preparing their students to go into careers in mathematics or even develop a specific set of skills. Sensemaking, as teachers described, was related to problem-solving and reasoning but particularly concerned with students' depth of understanding and their agency over their learning. They each named the importance of students having time to experiment, to make mistakes, and to develop the mindset that they were capable of finding solutions even when it was not straightforward. In this way, they emphasized that they felt that it was irresponsible to simply teach mathematics as a series of formulas and procedures to memorize because that would be a disservice to helping students develop as sensemakers.

They further rationalized their responsibility toward student sensemaking as a matter of preparing students to critically engage with their worlds. Carlos, for example, described how the current political climate made him think differently about his role as a teacher, stating,

> I feel like my perspective has changed a little bit. [My students] are still learning a bunch of formulas, and it's a lot of memorization that they've been taught that's what math is, to memorize formulas, to memorize procedures. And so, I feel that after the election [of Donald Trump], it's more important than ever to not teach those things, to teach them to think and to make sense of things in front of them. And so, equations, geometry problems, most of them in high school can be memorized, like the procedure to solving each one problem, but that's not helping them, you know. For me, to push them to approach a problem differently, in which they just tackle them, do what they can with it before [answering], I think it's more powerful. After the election, I'm like, that's the reason why students are not making sense of things. They just go with what they're told. I know this is not a political interview, but I feel like math is political in the sense that this

> climate, it's so important to be sense makers, you know? … Don't just wait for me to tell you, because I won't, because you shouldn't need me to. You shouldn't need anyone to tell you. And so even if it's not like the useful math, like, [when] am I going to use this in real life? It's just for that brain muscle to grow.

For Carlos, this drove his responsibilities as a teacher. He shared that his role was to "facilitate learning," "to pose questions," and to maintain expectations of students working through a problem without being told what to do. In his view, this would get students ready for the real world, where they would have to "figure things out without some very intelligent person in front of you telling you exactly how to do it."

Greta, in particular, wanted her students to develop a strong sense of self that would help them to navigate the unknown. She wanted to break students' notions that mathematics was about getting the correct answers and instead show them how to find comfort in not knowing what to do. Greta articulated that, in all circumstances, she wanted students "to step into the unknown and then to exist not knowing. To feel more comfortable not being sure and then come up with ways to help [themselves] feel more sure." There is no saying what the future holds, and she cannot prepare them for everything so she considered it a central responsibility to make sure her students could at least feel prepared to navigate all the unknown that they would experience in life. She would sometimes give this idea extra attention in mathematics because it was a subject that was so heavily associated with having clear answers. While in some topics outside of mathematics she might try to make abstract concepts more concrete, in mathematics she would do the opposite. She wanted her students to debate answers, to second guess themselves, and to

think through multiple possibilities. In all of this, she saw opportunities for students to develop agency by having a better understanding of themselves and what they were capable of.

Becca and Julie name similar values of critical thinking and sensemaking skills that they want students to develop in their class. Julie referenced the importance of students being able to make decisions and consciously consume data, hoping that "they can learn to really verify and justify without assuming things to be true." And Becca described how she wanted students to build confidence in their own understanding rather than relying on her to know when they were right or wrong. Overall, the responsibilities that teachers shared around the mathematical practices and mindsets that they instilled in their students were more concerned with how children navigated their worlds than what kinds of technical knowledge they gained. In many ways, these responsibilities reinforced their relational responsibilities by showing children that mathematics was a place where they belonged without having to prove themselves and to trust that they could engage with complex problems. However, teachers also had technical knowledge and procedures in mind that shaped the kinds of content that they taught.

Keeping doors open

In mathematics education, the courses that students take in high school (Algebra 1, Geometry, Algebra 2, and sometimes Trigonometry and Calculus) build upon one another and are often expected to be completed for students to have sufficient mathematical knowledge for college. They are frequently accompanied by standardized assessments to evaluate students' content knowledge and determine if they have mastered enough content for the next course. While not all teachers interviewed had the same expectations in terms of students' content

knowledge, they all named ways that expectations around content knowledge shaped their responsibilities.

Becca described this most explicitly, discussing how the structure of mathematics education shaped her responsibilities as a teacher because, whether she agreed with it or not, the fact that this structure existed meant that it would be irresponsible of her to teach in ways that closed off the opportunities inherent in following a traditional mathematics course sequence. In her words, completing this sequence of courses "opens doors for kids and if you don't take it, you close yourself off to a lot of things way too early on. So, like or not what's in the curriculum, it is opening doors for—or it's keeping doors open, I should say." Her school, Northeastern Girls Academy (NGA), is in a district where statewide standardized tests are given tremendous weight by school officials, administrators, teachers, parents, and students alike. Without sufficient test scores on their state mathematics tests, students are at risk of not graduating and of not having scores high enough to be considered "college ready," a designation with meaningful consequences for students' options after high school. Frequently, she heard concerns from parents and families about their children's scores on the exams, which reinforced her responsibility toward students' testing outcomes as a matter of being responsive to their families. These narratives about the significance of test-based achievement outcomes were ubiquitous to the point that to ignore them would be irresponsible. Thus, as Becca described her experiences of pedagogical responsibilities, testing became a common thread that shaped her work because it was a hurdle to students' future opportunities.

At the same time, Becca spoke about how her content-related decisions were shaped by a desire to expand students' knowledge beyond what was covered on their state tests. For example, writing proofs was a relatively small portion of the test. Proofs were also one of the most challenging topics for students to grasp. Because the test scores were what mattered when it came to students having the credentials that they needed to graduate and get into higher-level mathematics courses in college, Becca could have chosen to dedicate less time to proofs so that she would have more time to teach other content on the test. However, she expressed concern that if her students were not exposed to proof-based mathematics in Geometry, it would close them off to higher levels of mathematics by making "proof-based mathematics in college feel that much more foreign." Thus, she expressed her responsibility in terms of meeting both goals simultaneously—preparing students for the state exam and exposing them to the kinds of proofs they may reencounter down the line.

Carlos understood his content responsibilities regarding Geometry differently. He did not have the same demands as Becca to prepare students for a standardized assessment since he designed his own tests. He also found proofs to be one of the most difficult topics to teach, but instead of considering proofs as necessary to prepare students for mathematics later on, he was more concerned with their preparation for their following high school courses. As he put it; "yes, you cover [proofs]. But it's not as, I think, in my mind, as urgent as them being able to procedurally solve equations, for example, which happens in every math class from the eighth grade up until whenever you finish in college." Because so much of high school mathematics is focused on Algebraic reasoning, it was important that his students spent time exploring strategies

for solving equations. He wanted to ensure that students had the content knowledge they needed to continue onto Algebra courses because he did not want to be the one barrier to their understanding in later courses. As he put it, “I don't want to be the one teacher—that's like a point I make to myself—I don't want to be the one teacher that they didn't prepare their students enough. And they go to the next class, and they can pinpoint the reason they're not succeeding to me.” In other words, at least for his Resource Geometry class, Carlos saw his responsibility in terms of offering opportunities for them to learn the content they would continue to use in their high school level math classes.

Julie, because she taught at a school where all students were expected to finish the International Baccalaureate Diploma Program (DP), she had to teach them the content that would get them this credential. Following the DP curriculum, in the early years of high school mathematics, Julie emphasized key learning practices in combination with standard mathematics content. She could focus more attention on learning practices and mindsets. However, in 11th and 12th grade, learning became more heavily focused on the real-world applications of mathematical concepts and teaching a large breadth of material:

> It gets tricky, because we've got so much content to get through that I end up focusing more on content than I'd really—I mean, I love it, but this, again, is one of those, because we are an IB for all school, so all of the kids are in this class, not just kids who get things quickly. If that were the case, then we'd probably be able to get to some of the depth, because we could get through stuff faster. As it is, I feel like there's a big focus on deep thinking in 9th and 10th grade. And then 11th and 12th, it's okay, how do we apply this? And how can you use it? And it’s very application-based, which is great, and I think

> there's a lot of value to that too. So, we do get into, you know, modeling exponential situations, or all of all kinds of really practical things. So that's good. It's just less of what, you know, the esoteric parts of math that I enjoy, too.

The quote above speaks to how Julie saw her responsibilities in terms of balancing in-depth conceptual understanding and mathematical explorations with getting through all of the content that students need to finish the DP, which was more heavily focused on the applications of mathematics. Based on the curriculum that she was using and the expectations of the program, Julie found that she had a greater responsibility to emphasize mathematical content with older students, whereas she had more flexibility to focus her time on mathematical practices and explorations in earlier grades, which in itself was an important responsibility. This trend seemed to occur with other teachers in that the closer their students were to graduating, the greater responsibility teachers had to cover content over making time for in-depth understanding.

Greta, teaching middle school students, found that she could find more reasons to maintain a focus on practices and relational responsibilities over content. Her context was unique in that she did not have any mandatory assessments students needed to take in mathematics, nor were there specific content standards that she had to meet. Nonetheless, she had an idea of what students were expected to learn before high school and made efforts to incorporate that content while prioritizing her relational responsibilities and supporting students' agency. In her view, committing to a set of standards or goals was in contradiction to her desire to be responsive to students. Her content goals were more about exposing students to different topics in pre-/algebra so that they would at least have some familiarity with them, because she wanted students to have

access to every option they might want to pursue. As such, Greta might include mathematical content that she herself did not see the value in simply because she viewed mathematics as a gatekeeper and she wanted to make sure students had the knowledge to get through the gate.

At the same time, Greta was more concerned with students developing a strong number sense and having plenty of time to understand a problem thoroughly. If that meant that she could not cover all of the content she had intended, so be it. It was a mindset she had developed through her career, that the content that she taught students was not as important as what students learned about themselves. She caveated that others might view that mindset as irresponsible and that she has gotten feedback from some parents concerned that their students are not at the same level as their high school peers who are taking Algebra 1 in 8th grade. She recognized that the expectations in mathematics are that students are mastering more and more content, younger and younger. However, she maintained her motto that "everything matters, so nothing matters" as a reminder that she would always fall short of meeting every expectation. All she could do was make the best decision for her students in the moment, and for her, that decision meant attending to students' feelings in mathematics over their mastery of content. By maintaining a responsibility toward students' sense of self, they would be able to learn anything they wanted to, even if they did not have the same on-paper knowledge as their peers.

All four teachers articulated responsibilities toward ensuring students could access future opportunities. Yet what this meant in practice varied significantly based on context. For some, it meant preparing students for standardized tests that determined graduation eligibility and college readiness. For others, it meant ensuring students had content knowledge for subsequent courses

or credentials like IB diplomas. In each case, teachers saw themselves as responsible for including content they might not otherwise prioritize—not because they valued this content most but because the gatekeeping function of mathematics education made it consequential to students' futures. They worked to meet these content-related requirements while foregrounding their relational responsibilities and attending to students as sensemakers—attempting to honor both the sensemaking purpose they valued and the credentialing purpose the system demanded. To navigate these competing purposes, teachers engaged in ongoing professional learning and sought relationships with colleagues who could support them in finding ways to balance responsibilities that often felt impossible to achieve simultaneously.

As Part 1 has established, teachers' pedagogical responsibilities reflected competing purposes for mathematics education: developing students as critical thinkers and sensemakers and ensuring access to future opportunities through credentials and content mastery. Teachers valued both purposes yet experienced them as difficult to honor simultaneously. Part 2 examines how teachers navigated these tensions in practice—exploring the impossible binds they faced when purposes conflicted, the identity work and emotional labor this navigation required, and the resources and strategic choices that shaped what seemed possible.

Chapter 6

Findings Part 2:

How teachers experience their varied pedagogical responsibilities

Through case narratives of Becca, Julie, Carlos, and Greta, this section reveals that teachers navigated impossible binds—situations where competing responsibilities couldn't all be honored simultaneously and where no clear "right answer" existed. Each case explores the identity work and emotional labor this navigation required, the resources that shaped what seemed possible, and the strategic choices teachers made about where to invest their limited energy. Three patterns emerged across cases. One is that teachers' navigation of their pedagogical responsibilities was inseparable from profound emotional experience—of joy, fulfillment, tension, doubt, disillusionment, and failure. Rather than operating as a separate dimension of teachers' work, emotion ran through how teachers experienced their identities, engaged with resources, and made strategic choices about where to invest their energy. These emotions were not distractions from their responsibilities or reactions to them but part of how teachers sensed what mattered, what felt urgent, and what choices felt justifiable. A second pattern was that teachers experienced many resources as double-edged: resources provided tools but promised solutions that remained elusive, leaving teachers to question themselves and their competence, or to experience frustration with structural contradictions that they remained unable to resolve. Third, teachers' own racialized identities significantly shaped how they experienced their pedagogical responsibilities and tensions between them.

Together, these cases demonstrate that teachers' sense of pedagogical responsibility is not a matter of choosing correct priorities but of making provisional choices within contested terrain, shaped by who they are, what resources they can access, and structural conditions they cannot control. Each case begins with a poem drawn from the teacher's language that captures the core tension they navigated—an analytical and creative practice that allowed me to honor both the substance and emotional weight of their experiences. I encourage readers to reread, pause, and sit with these poems; to submerse yourself in the tensions, the feelings, and the contradictions that these teachers are navigating.

Becca

All-girls school
Black and Brown girls
Who am I to say?

I want more kids that look like them in math class
Doing math at higher levels
What really matters
To belong in that space?
Not just the scores or standards
But emotionally
Who am I to say?

The community of kids
Care deeply about the test
We try to break that idea
That you only work for yourself
We are trying
Very slowly
To shift kids' perspectives
To not just get into the room
But to feel like you belong
Every day

But so many kids
And their parents
Care deeply about the test
The scores, in this city, they stick
"Why are you only getting
this on your geometry test?
Theystickwithpeople

Who am I to say?

That they should care about this thing
thinking; making connections; sharing knowledge; reasoning
noticing; creating; discovering
This thing that I care about
When really
They really do care

about the test

Poem 1: Becca

As a White mathematics teacher of predominantly Black and Brown girls, Becca wanted to strengthen her students' sense of belonging in mathematics because she believed she had a responsibility towards there being "more kids that look like [my students] in math classes and doing math at higher levels." As she saw it, that aim required not only supporting students in developing mathematical knowledge to earn necessary credentials but also fostering a classroom culture in which students felt that they were valued. She and her co-teacher, Jeremy, shared this goal and spoke about what mattered when it came to students' futures. Yes, their scores on the standardized tests mattered, in a practical sense, but so did their sensemaking, their emotions, and their experiences of mathematical practices as communal. This sense of belonging was central to her pedagogical responsibilities yet was surrounded by uncertainty stemming from two distinct definitions of belonging in relation to mathematics. By one definition, passing test scores were of primary importance, while the other prioritized students' conceptual understanding and positive view of themselves and their peers in relation to mathematics. Theoretically speaking, these two ideas can complement one another, yet Becca felt the need to actively defend her own idea of belonging when others, including her students and their families, perceived her goals as unnecessary additions or even barriers to their own.

Becca's experience of this tension was shaped by emotions that pulled her in different directions. On one hand, she described a sense of pride in proving that there were better ways to teach that did not rely on direct and test-driven instruction. She was motivated by her commitment to pedagogical choices that centered student thinking and discovery-based learning

because those were the practices that she felt could make a real difference in students' mathematical futures. She aligned these pedagogical decisions with student belonging because these techniques provided opportunities for students to work collaboratively and engage with content more deeply, which supported confidence in their mathematical abilities and their preparation for the kinds of thinking required in higher-level mathematics courses. She was adamant her instructional methods could also stimulate test-based learning because "there's crossover between being able to view the test as a problem-solving opportunity and if we truly teach kids to problem solve, shouldn't they be able to do it on the test?" Yet, she acknowledged that they had yet to achieve both ends: "We haven't gotten there yet."

On the other hand, this feeling that "we haven't gotten there yet" led her to question her identity as a good teacher and her authority to say what was best for students if she was simply not able to do it all. In asking, "Who am I to say?" she acknowledged that, despite her intensely felt educational commitments, they were not sufficient in the face of narratives around test-based measures of success that were deeply rooted in the communities and histories of her students.

Identity binds: Balancing "good" teacher identities

Becca herself was caught up in distinct narratives of responsibility. Early in her career, she had invested in a teacher identity that was philosophically opposed to test-based instruction. Her professional development as a teaching assistant fostered her belief in all students' mathematical capabilities and what was possible when students were exposed to problem-solving and discovery-based instruction. During her student teaching experience, she worked with a teacher who cared a lot about the test: "the instruction was so poor where I [became] so firm in

my beliefs that teaching to the test sucks…there was no tension there because I also saw teaching to the test poorly and students still not understanding." Seeing the failures of direct instruction motivated by testing outcomes cemented Becca's feelings to the point that it did not experience conflict between her responsibilities at the time. And when she took a job at NGA, she saw her department chair as a "phenomenal teacher" who could navigate testing pressures without succumbing to teaching to the test. Together, these experiences made Becca feel it was possible to teach in the ways that she wanted, even in a district that gave tremendous power to the test.

The tensions she experienced between more student-centered instruction and direct instruction grew after COVID-19. During the pandemic, mandatory testing paused and Becca experimented with BTC and discovery-based methods. But her supportive department chair left, and when testing resumed, Becca felt that she, Jeremy, and one other teacher were "alone" in challenging direct instruction. She felt she should "have it figured out" by now—her former chair had managed it after all. And she described it as "a point of pride...to prove a point here that you don't have to teach that way." Despite doubts about whether she could navigate testing demands, she refused to give in. She held onto the identity she had forged as a teacher driven by creative possibilities and fostering student sensemaking rather than by test coverage.

However, her motivations were challenged by families' concerns. State exams had existed in the local school system for decades. Many parents could remember exactly what score they got on their Geometry exam and expressed concern that their children were not doing as well as expected. Students' own sense of belonging was also entangled with dominant systems and narratives that associated belonging with test scores. When students did not see expected

gains, their own sense of belonging suffered: “part of getting into the room is passing these tests…feeling like you belong there and you deserve to be there, is different. But for so many kids, they derive that from the sense that they passed the test and got there.” For Becca, the test mattered because of how students and families cared about it, leading her to question: “Who am I to say what the community of kids and parents that I serve should care about? That they should care about this thing that I care about when they really do care about the test.”

Becca's desire to promote belonging was motivated by her understanding of racial inequities in mathematics and wanting to support her Black and Brown students to see themselves as mathematically capable. Yet students' and parents' priorities made her question whether it was her place to push for different instruction. In navigating these competing narratives, Becca wasn't only trying to figure out what was best for students but also what kind of teacher she wanted to be. She had built an identity that didn't rely on test-driven instruction—an identity drawn from her experience and professional knowledge. Yet as a White teacher working with predominantly Black and Brown students, she understood the limits of her own knowledge and experiences. She did not grow up in this community and thus did not have the same relationship to the test. She had a responsibility to be responsive to the ways her progressive values might ultimately hold students back from future opportunities or from realizing their own capabilities.

This identity work—maintaining her commitment to student-centered teaching while questioning her authority to define belonging differently than families did—was emotionally exhausting. It required constant negotiation between her pedagogical values and her

responsibility to be responsive to the community she served. But going against her vision had its own emotional costs. She could not simply choose to abandon her vision because she knew that test results might be necessary in the short term, but they did little to support students' long-term sense of belonging in mathematics. While she aimed to accomplish both goals—getting students the test results they wanted while maintaining her responsibility to student sensemaking and belonging, she had continued to come up short. The resources she engaged with to navigate this tension both helped and complicated her navigation in ways that reveal important dynamics about how teachers make sense of their work.

Resources shaping navigation: Tools that enable and constrain

Becca actively sought out resources beyond her school context, and her engagement with them did not simply fill gaps in her knowledge or confirm existing beliefs. Resources shifted what felt possible, legitimate, and justifiable in her navigation of competing responsibilities, while simultaneously introducing new uncertainties. Their value was not in resolving tensions but in shaping how she understood and inhabited them.

In many ways, resources served to validate her commitments and give her language to defend them. Her former department chair had been instrumental early in her career, providing both philosophical alignment and practical guidance for navigating testing pressures. The chair had facilitated professional development opportunities that encouraged teachers to engage in mathematical problem-solving themselves, modeling how to maintain commitment to discovery-based learning even within testing constraints. When Becca felt stressed about the test, the chair would remind her: "the test is dumb. All they get if they pass your test is a sticker on their

diploma." This relationship permitted Becca to prioritize what she valued even when it conflicted with institutional pressures.

Later, Becca adopted BTC methods because they aligned with her existing beliefs and presented concrete practices and vocabulary to justify her approach to skeptical colleagues. Furthermore, her co-teacher, Jeremy, followed a similar philosophy to hers, making the transition to BTC smoother than it might have been otherwise after her department chair left the school. Working with a colleague who shared her philosophical viewpoint helped sustain her commitment when she felt "alone" in challenging direct instruction. Their shared "point of pride" in wanting to prove alternative methods could work motivated them to continue despite pressure from colleagues and families. This social resource—someone who validated her approach and shared the emotional labor of resisting dominant narratives—was critical to her continued navigation. In fact, given the lack of other social support systems within her school, Becca said that if Jeremy were to leave NGA, she would soon follow.

These resources—BTC offering concrete practices aligned with her philosophy and the social support of her department chair and Jeremy—made certain responsibilities feel more legitimate and defensible. It did not resolve the tension of navigating testing demands and responding to parents' concerns, but they affirmed that her interpretive stance was justifiable.

In other ways, Becca found that resources both expanded her sense of responsibility while destabilizing any single answer. While she was a strong proponent of BTC for promoting student thinking, the challenge remained of navigating her responsibility toward problem-solving while preparing students for test success. Theoretically, she saw these as connected, stating, "if

we truly teach kids to problem solve, shouldn't they be able to do the test?" Yet her experience showed this connection wasn't straightforward. While BTC described itself as flexible enough to include curriculum-aligned instruction, she found that "we have not gotten the speed promises it gave." This created a bind for Becca. The resource that gave her confidence and tools to enact practices she cared about also suggested that any failure to achieve both sensemaking and test preparation simultaneously was an implementation problem, not a structural contradiction. When she couldn't get through content quickly enough while maintaining depth, the framework implied she wasn't doing it correctly, placing responsibility on her rather than acknowledging the fundamental tension between the purposes these practices served.

This tension was compounded by the mixed messages she received from her school administration. On one hand, the supervising staff granted teachers autonomy—trusting them to make pedagogical decisions on behalf of their students. When Becca wanted to implement BTC, she was given the resources she needed: different desks and seating options to encourage standing and collaboration, and more vertical whiteboards for group work. Furthermore, no one was actually requiring that she dedicate more time to direct instruction to improve test scores. Yet even though they did not directly pressure her to increase her pass rates, they would discuss pass rate data in a way that implied that it did, in fact, matter. At least one colleague felt that Becca's approach placed additional burden on her own classroom, expressing that she felt "immense pressure" because students weren't passing her tests at sufficiently high rates. The implication was that someone had to compensate for what Becca wasn't doing.

Becca encountered similar complexity when she sought resources to improve her instructional approaches for students with disabilities. Rather than offering clarity, these resources revealed competing epistemological frameworks—mathematics education research and disability research operated from different assumptions about evidence and what "works." As Becca described, “a lot of research on teaching students with disabilities has come through a behaviorist lens…And then the math education-specific research has been situated in a different field. And so, because there are those different fields, natural ways of asking questions and what they look for as evidence is different…It has led to these different theories of what works for how you teach math versus how you teach students with disabilities.” This idea that different resources promoted different and often contrasting perspectives on what mathematics education should look like came up frequently in our discussions. However, while it contributed to her uncertainty, Becca expressed that it also allowed her to see that there was not a single right way or a wrong way, “we’ve all maybe created this false dichotomy.” As she put it, the result was both feeling more tension but also “more relieved.”

Accepting tensions as expected, Becca actively worked with tensions rather than always seeking to resolve. She challenged dichotomies pitting direct instruction and discovery learning against one another, suggesting that test-like problems could be opportunities for critical thinking and problem-solving. She attempted to use the test itself as a resource—designing problem-solving tasks that also prepared students for the kinds of questions and language they would encounter on the test. She tried to create opportunities for students to make connections between mathematical investigations and test problems while also addressing questions that students

themselves were curious about. This approach required finding problems that were simultaneously rich enough for discovery, aligned with test content, and engaging to students—a difficult balance that resources like BTC acknowledged but did not fully resolve.

Outside of her school, Becca was a member of an organization designed for the professional development of mathematics teachers (PDM). PDM not only provided financial resources—fellows received a yearly stipend—but also offered a community that normalized working critically within competing frameworks. With BTC, for instance, while she had discovered this resource on her own through online communities, she also participated in a workshop organized by PDM that was specifically intended to examine BTC critically—to adopt the practices that felt meaningful while also making adjustment to better suit each teacher's unique context and varying demands. Additionally, PDM workshops were often designed by practicing teachers and explored creative and ambitious topics that she might not have otherwise been exposed to. PDM not only expanded her network of professional support but was a space that normalized critical discussion of pedagogical practices and encouraged her to be creative in her teaching.

Resources did not resolve the structural tensions Becca faced; students still needed to pass tests, competing frameworks still offered contradictory guidance, and institutional pressures persisted regardless of which pedagogical approach she followed. But they shifted how she understood her navigation: not as repeated failure to find the correct answer, but as principled work within genuinely contested terrain. In this way, resources were generative—not because

they eliminated uncertainty but because they gave her the conceptual and relational tools to keep working within it.

Navigating with resolve: Strategic planning within contested terrain

Becca's case illustrates how teachers' self-identities are caught between competing narratives of what it means to teach mathematics in ways that challenge dominant systems. Her sense of responsibility required balancing a view of good teaching as supporting students' belonging through allowing them to deeply explore mathematical concepts with a view of good teaching as being responsive to the inequities faced by Black and Brown girls. She felt a high responsibility for "providing instruction that gives students the tools and knowledge they need to pass external assessments" because it was wrapped up in her responsibility to "teach students in ways that honor the values and wishes of their families and communities" and "make sure that students feel trust from their teacher in their mathematical abilities." In other words, her responsibility to prepare students for the test only had meaning because it allowed her to be responsive to students and families and build students' confidence in their mathematical abilities.

She navigated this tension through strategic decision-making during planning. When planning lessons, she permitted herself to make choices about what to prioritize in particular moments—sometimes choosing direct instruction when it felt necessary for the sake of time. But she didn't simply capitulate to test-focused teaching. Instead, she attempted to connect these practices to purposes that aligned with her goals of belonging. For instance, when using direct instruction, she would tell students this was good practice for what it would be like to experience a lecture in college, reinforcing a concept of belonging associated with how comfortable students

would feel in higher-level mathematics courses. Through reframing lessons that went against her own vision of mathematics, she maintained her sense of purpose and responsibility rather than being paralyzed by uncertainty in the moment of teaching. Her strategic navigation during planning—making provisional choices about priorities while attempting to reframe compromises in ways that aligned with her values—shows how teachers exercise agency within structural constraints that make full coherence impossible. For Becca, sustaining that agency required not just strategic thinking but ongoing emotional work: holding onto pride in her vision even when the evidence was not yet there to vindicate it.

Furthermore, Becca's case shows it's not enough for teachers to invest in their own learning and develop ideologies that encourage them to see all students as mathematically capable. Becca was highly invested in the idea that students had the capacity to learn through discovery-based mathematical investigations that would develop them as sensemakers and prepare them for future mathematics courses by fostering confidence and conceptual understanding. Her ideas about what was possible within mathematics were reinforced by technical, conceptual, and social resources that reassured her she was on the right track. These resources motivated her with the idea that it was possible to do it all—to teach the ways she wanted and give kids the success on the test they wanted. While she passionately challenged the value of the test for measuring student understanding, she also recognized that to "prove" her teaching worked, test results were the only evidence she could reasonably use. Her strategic navigation during planning—making provisional choices about priorities while attempting to

reframe compromises in ways that aligned with her values—shows how teachers exercise agency within structural constraints that make full coherence impossible.

Like Becca, Julie also experienced tensions between competing purposes and questioned whether structural contradictions she faced were "me problems" or systemic issues. However, Julie's navigation was complicated by her isolation as the only mathematics teacher at her school and her uncertainty about whether creating alternative pathways for students was responsive teaching or perpetuating harmful labels about student ability—a tension that her whiteness made particularly fraught.

Julie

The goal was to be diverse
Racially and economically and culturally
A nurturing environment
IB for all
That's how we operate
Rigorous education for all students
At every level

But
We're new
We're small
Very small
Private but
Anybody who wants to go here can go here
We're not testing
Sliding scale tuition
We need the numbers

But
I mean
Ideally, that's great
That's who we love
That we could always do that

But
It does feel very challenging
IB for all. These high-level requirements
I'm not sure how realistic it is to continue this path
How do I help?

IB for all
I'm constantly asking myself
Does that make sense? Can we do that?
Are we setting kids up for failure?
I think
I really do think
That the grade level kids. They can be successful
They really can
It's the kids that struggle
They're below grade level
They're not meeting their own expectations
It's discouraging
Is this a me problem?

Poem 2: Julie

The poem that opens this case captures the bind that Julie faces precisely: 'ideally that's great'//'are we setting kids up for failure?' She was caught between truly believing that all students were capable of the high-level requirements of the IB curriculum and feeling that not all students were able to succeed within a system where meeting those standards was the only way be successful. These ideas were not contradictory in Julie's philosophy—they coexisted as simultaneous truths that her context forced into opposition. The question 'is this a me problem?' that haunts the poem is not rhetorical; it is the question Julie cannot answer because her context obscures where personal responsibility ends, and structural impossibility begins.

Willow Academy explicitly named "IB for all" as their mission, but Julie found herself caught in a bind. She was a strong advocate of the IB curriculum, especially at early high school levels, which emphasized important mathematical practices (e.g., pattern generalization and mathematical reasoning). Yet since the school was still in its infancy and needed students, they accepted all applicants regardless of their previous academic record. On one hand, Julie was glad they could offer rigorous education that any student could access. On the other hand, she struggled with her feeling that it was unrealistic that all students who applied were ready or desired to complete IB-level coursework by graduation. Her responsibility toward equitable education within an "IB-for-all" school created an irresolvable tension: if she truly believed all students were capable of IB-level mathematics, it shouldn't matter that Willow Academy accepted all students—yet she felt it was irresponsible to hold all students to that standard.

Was it responsible to promise IB for all when not all students were prepared to meet that goal? Was it responsible to maintain a singular focus on college acceptance as the pinnacle of high school success rather than supporting students in other goals they had for themselves? These questions that Julie reflected on came from a place of care for students—wanting to help them feel confident and capable. However, Julie also worked as the sole math teacher at the school, which constrained her capacity to provide differentiated instruction and, more significantly, left her without colleagues who could speak to this particular dilemma. Without access to supportive feedback that validated her experience of this dilemma, she had little outside perspective to help her distinguish between structural critique and personal failing.

Identity Binds: Questioning from within

The way that Julie spoke about navigating this tension was frequently filled with self-doubt as she questioned whether it was she who was failing to adequately respond to her students' needs, not the fault of the IB for all mission. At the same time, she shared hope and excitement when reflecting on moments when she was able to meet students where they were at. In one instance, she discussed her enthusiasm about being able to work one-on-one with a student whose mathematical abilities were far below her grade level—she was a high school Junior with scores comparable to a second-grade student. This student, called Miya here, was enrolled in Willow Academy, yet she did not have the prior knowledge needed to meet the requirements of an IB-level curriculum. In addition to being the only high school mathematics teacher at the school, Julie had just become the Title I teacher and was able to work with Miya one-on-one in this capacity.

Before their work together, Miya had been supplementing her mathematics class with online courses to support her understanding of basic mathematics concepts (e.g., rounding decimals and working with fractions). Because this course was designed for second-grade students—using word problems with pictures of dump trucks—Julie could tell, “she just feels like this should be beneath her, but she can’t do it.” Although Julie shared that Miya needed more help than Julie could provide on her own, she expressed pride and excitement that she could help this student by working through material that was more developmentally appropriate for Miya’s age. Julie considered how she could teach rounding and fractions as real-life skills that would be applicable to Miya and to teach her that instead of algebra, “because that’s what she needs.” In this instance, Julie was not concerned about Miya not meeting the standards of an IB-level curriculum. Rather, she shared enthusiasm about meeting her where she was at. This story highlighted how Julie coped with the inherent uncertainties that she faced. Julie’s excitement to teach this student rounding did not resolve the tensions she felt between differentiation and high expectations—it reflects how she learned to find meaning in spaces of irresolution.

This experience was not isolated to one student. Even students that Julie described as, “grade-level”, Julie struggled with questions about whether her instruction appropriately set students up for success. She was highly attuned to how labeling students based on mathematical performance could be counterproductive to their sense of belonging. Yet she also recognized that students' sense of belonging was related to their achievement, and not all students would achieve at the same pace.

Julie felt unsure about how to express that students needed more differentiated instruction without it conflicting with her belief in the mathematical capabilities of all students stating,

> But I, you know, I, I want to create a space for kids who don't, don't, maybe aren't the highest achievers, but could still enjoy math and get, get the minimum requirements that they need for a good, to get, for college and something that would be applicable to their lives. So, I don't really know how to frame or summarize that other than what I just said, but I don't feel like I have a succinct way of saying that, nor do I have a way that I would want to communicate that to families or to students themselves. Like this is for, you know, for low-achieving students. I'm not going to say that. I don't believe that.

As she shared this, I could see and hear her hesitancy to even say "highest achievers" or "low-achieving students" as she stumbled through her words and couched these labels in disclaimers like "I don't believe that." She indicated that these labels went against her own attempts to challenge the categorization of students in terms of "achievement." This was reinforced in other instances during our interviews. In one case, she shared how during an IEP meeting she had said a student "has a natural interest in math" and quickly thought to herself, "Ahh, I'm not supposed to say that." Although she didn't name exactly why she felt she was "not supposed to say that" or explain her intentions in saying it, these moments of reflection on her own word choices demonstrated how her responsibilities were shaped by two narratives she experienced as contradicting one another: one telling her to meet students where they are and tailor instruction to their varying needs and interests, another telling her that all students deserve and are capable of rigorous mathematics education. Julie's difficulty articulating her approach to

differentiation is not a linguistic problem—it is evidence of a genuine philosophical bind that her context made irresolvable. Her stumbling over words like 'highest achievers' reveals a teacher who has internalized two competing narratives that cannot be reconciled within the structure of her school.

Julie was also aware of how her own whiteness might limit her understanding of her students' experiences and what kinds of support they needed. She wondered, "especially in my whiteness…is there value in me pushing back or is there value in me just trusting their own experience?" Although she didn't recall specific interactions with parents that led to these questions, she thought of interactions with her current head of school, Kendra, an African American woman who had recently started at Willow with her own agenda about what education students needed.

Before Kendra's arrival, the college counseling program at Willow was called "post-secondary counseling" in an effort to "make space for whatever kids do after high school." Although college counseling was still a primary responsibility of the program, the more expansive language aligned with how Julie wanted all students to feel they had options beyond a traditional college trajectory. This was apparent in how she spoke about the usefulness of mathematics to students—highlighting real-life applications and critical thinking skills they could use in daily life, such as teaching rounding to the student working at a second-grade level.

Kendra, however, responded negatively to this branding. Julie paraphrased Kendra's response as follows: "Absolutely not. Every student here needs to be prepared for college. And we want to call it college readiness or college counseling, because we want to encourage all

students to do that, and we don't want to make space for those who don't." Julie understood that Kendra wasn't advocating the school be exclusive toward students who chose not to go to college, but that all students should be encouraged to go to college rather than be made to feel that non-college pathways were better options for them. This framing prompted Julie to consider how her desire to create a schooling structure that valued multiple learning trajectories might be holding students to lower standards than they deserved.

It mattered that Kendra was an African American woman and that their school served predominantly African American students. Julie considered herself a strong proponent of racial justice. She had recently completed a master's degree in Diversity and Equity in Education that supported her in developing a justice-oriented identity. Until recently, she had a stipend to take on a student advocacy role through which she helped students host affinity groups and celebrate different racial and cultural heritage events. Although she had not been keeping up with this work as much as she would like due to lack of funding and resources, she still considered the perspectives fostered in her master's program important to how she made sense of her pedagogical responsibilities. Even if she wasn't giving explicit attention to race and diversity in her class, she felt a responsibility to challenge the idea that "there's one way to exist in the world…that there's some absolute truth to the way people should be." As such, her desire to promote multiple pathways was about upholding a belief that children should be encouraged to embrace who they are rather than being held to a standard someone else has made for them. When Kendra challenged the branding of "post-secondary counseling," she wasn't only

questioning the idea of promoting multiple pathways but also challenging Julie's view of herself as an advocate for racial justice.

While she didn't completely agree with Kendra, Julie recognized that Kendra carried greater authority to speak on what structures best served their students—both as head of school and as a Black woman with direct experiential knowledge of what kinds of opportunities Black students need. This recognition added a layer of complexity to Julie's self-doubt: her uncertainty was no longer only about pedagogy but about whether her positionality as a White woman shaped her blind spots in ways she couldn't fully see from within. Returning to the question, “Is this a me problem?” Julie was not just questioning herself as a good teacher but questioning whether her whiteness was part of the problem. Yet this questioning stance was itself a form of commitment to her felt responsibilities—rather than resign herself to uncertainty or defer entirely to someone else's vision, she remained engaged in dialogue. With Kendra, Julie made it clear that the conversation was ongoing.

Julie's navigated competing narratives about differentiation, ability, and equity. She wanted to create multiple pathways for students but worried about perpetuating harmful labels about who could succeed at what level. She valued her justice-oriented identity but questioned whether her progressive commitments—shaped by her whiteness and her educational training—might undermine the very students she sought to support. Unlike Becca, whose experience centered on defending a teaching approach against institutional pressures, Julie's experience centered on questioning whether her approach itself was the problem. This self-doubt was

amplified by her isolation as the only mathematics teacher at her school and her limited access to the kinds of collaborative resources and feedback that might help her work through these dilemmas. The emotional weight of this was significant—without colleagues to help her distinguish productive self-reflection from paralyzing self-doubt, Julie cycled between moments of genuine excitement, like her enthusiasm working one-on-one with Miya, and profound uncertainty about whether she was the right person to make the choices her role required. As the next section explores, this isolation shaped not only her identity work but also how resources functioned in her navigation—providing some support but ultimately leaving her wondering whether structural contradictions she faced were "her problems" or systemic issues beyond her control.

Navigating alone: Resources without community

Julie actively sought resources to supplement the support she lacked at her school, but her engagement with them was shaped from the outset by self-doubt. Unlike Becca, who approached resources as tools to critically engage with and adapt, Julie approached them as potential solutions to inadequacies she feared were her own. This orientation shaped not just what resources she found useful but how she interpreted their limitations.

After reading *Building Thinking Classrooms* (Liljedahl, 2020), Julie started implementing practices such as using vertical non-permanent surfaces, visibly randomized groups, and rich thinking tasks. A significant change that she noticed in her practice was that the kinds of questions she asked often directed thinking back to the students and positioned them as problem solvers. In her words, “the question I ask is basically going to require them to use the tools that

they already have in a new way that they've never thought about using them." BTC became a resource for determining questions she could ask and problems she could pose that would prompt students to pull from their prior knowledge to approach topics they had not yet seen. She expressed excitement about these practices, despite her discomfort in enacting some of the suggested activities.

Using these open-ended rich thinking tasks aligned with the responsibility she felt toward allowing students to exist and thrive in multiple ways, rather than having to conform to a single approach. At the same time, the difficulty she had presenting these tasks without a clearly determined solution path related to the uncertainty she felt around the purpose of mathematics and her role as a teacher. When sharing her passion about making sure kids have access to multiple models of what it means to be successful, she also admitted that, "my default way of being is it's easiest to teach that there is one way to do things…to try to help them all look the same." This was complicated by the fact that upper-level IB curriculum left less room for open-ended exploration, making her default toward procedural teaching feel both easier and more defensible.

Yet, she also saw value in these types of tasks because they pushed her out of her comfort zone by challenging her to use material that was more open-ended than she was accustomed to. Instead of avoiding these tasks, she found resources that helped her to present them with more structure in her planning and guidance while still allowing students to approach the problem in their own ways. In this case, she found resources that allowed her to teach material more

confidently despite her feelings of discomfort. In other instances, however, the resources that she found became fuel for more self-doubt.

During our final interview, in which Julie reflected on the extent to which she felt personally responsible for different educational goals, she ranked highly the idea that she was personally responsible for "coming up with activities and problems that promote high levels of student engagement." Student engagement was perceived as evidence of effective teaching because, in Julie's mind, if you can engage students, you can get through content more quickly while also making personal connections with students by relating to their interests. These were ideas reinforced by the books that she named as meaningful to her professional development: specifically, BTC and *The Disengaged Teen: Helping Kids Learn Better, Feel Better, and Live Better* (J. Anderson & Winthrop, 2025). BTC proclaims that by using rich thinking tasks regularly, along with other suggested practices, teachers will actually get through content faster because students will be more engaged in thinking—the same promise that Becca identified. *The Disengaged Teen*, as Julie described it, argues that sometimes all that kids need to be more captivated and less resistant in their learning is to find a single topic that genuinely interests them.

Julie took these ideas to heart: "I mean, if you have engaged people, you can get through stuff really quick." Yet, while she believed this to be true, she was discouraged by attempts she perceived as failing to achieve that goal:

On the last week of school, I didn't have to get through any particular content, so I was really excited. One of my most disengaged students is a phenomenal soccer player. His life is

soccer. And so, I thought, let's go build a field. We'll go out to the park, use Pythagorean theorem to build right triangles and they can create a field. He could do this wherever he goes. And I thought, this is amazing, he'll love this. But he ended up writing with sharpie on the sidewalk…I didn't prepare the lesson well. I had thought I was really prepared but it was my first time doing it and it didn't go that well. It was this perfect example of trying to create something that I thought he would really care about and might motivate him, like maybe *this* is the thing. And it was a failure.

She continued to feel as though if she just knew more about mathematics in context, or if she was better prepared, or had more strategies to support students beyond her "default," she could find a solution that would both help students succeed along multiple pathways *and* support their mathematical capabilities. The same resources that gave her justification for her approach became measuring sticks against which she found herself falling short, deepening rather than relieving feelings of self-doubt. Without colleagues to help her interpret these moments of perceived failure, Julie had no way to distinguish between her own limitations and the unrealistic promises of the resources themselves—a distinction that her isolation made nearly impossible to see.

Julie constantly felt that there was more she could be doing to resolve the tensions she experienced. Resources did provide some foothold—BTC gave her concrete practices she could implement with growing confidence, and finding structured ways to present open-ended tasks helped her move past some of her discomfort. Yet the self-doubt she felt around her pedagogical capabilities was further apparent in how she engaged with social resources. As the only

mathematics teacher at her school, Julie didn't have access to the kinds of feedback and collaborative conversations that would help her understand if her instructional methods were sufficient. Although she found resources elsewhere—discovering BTC through a Facebook group for other IB mathematics teachers and finding *The Disengaged Teen* through other informal means—the isolation she experienced at her school frequently caused her to see her inability to effectively enact learned practices as personal failures. In turn, these experiences of self-doubt made her lack trust in her own expertise, causing her to engage passively in her learning, further compounding her self-doubt.

In the Facebook group she had joined for IB mathematics teachers, she did not actively participate in discussions of pedagogy. Rather, she used this as a space to see what resources other teachers were sharing and how these teachers reflected on their own practice. She was hesitant to share resources herself because she did not trust her own knowledge to validate their effectiveness. Because she did not have regular opportunities to get feedback from other mathematics teachers on the material she was using in her class, she expressed that she did not want “to share stuff that’s not been vetted.” The lack of opportunities for feedback and collaboration with other mathematics teachers was experienced as a barrier to her being able to resolve pedagogical dilemmas. In other words, the lack of social systems of support actively compounded her feelings of self-doubt by leaving Julie as the only available explanation for why things weren’t working.

The question 'is this a me problem?' captures something analytically significant about Julie's experience that goes beyond the practical problem of isolation. It is not simply that Julie lacked colleagues to help her distinguish personal from structural challenges—it is that the conditions of her work made this distinction functionally impossible to maintain. Unlike Becca, who could critically engage with resources through PDM workshops and discussions with colleagues, Julie consumed resources in isolation. She read books, implemented practices, and evaluated their success largely on her own. When they didn't deliver on their promises, she had no community to help her understand whether the problem was her implementation, the structural constraints she faced, or the resources themselves. The same resources that helped Becca see she was navigating contested terrain left Julie wondering if she was simply failing to implement correctly. This distinction captures something essential about how emotion functioned in Julie's navigation: isolation didn't just limit her access to practical support, it left her emotional experience of difficulty—the self-doubt, the sense of inadequacy—with nowhere to go but inward.

Navigating in isolation: Self-doubt without collaborative infrastructure

Julie's case reveals how isolation compounds the feelings of self-doubt and uncertainty teachers face when navigating competing purposes. For Julie, this isolation made it difficult to distinguish between pedagogical challenges and structural contradictions. Was differentiating instruction without perpetuating labels a problem she could solve with better strategies, or was it an impossible tension built into the "IB for all" structure? Was creating multiple pathways responsive teaching or lowering standards? Without colleagues to work through these questions

with her, resources like BTC and *The Disengaged Teen* provided frameworks but no collaborative space to critically examine their promises or her context. They gave her some concrete practices to try but left her alone with the doubt when those practices didn't resolve her fundamental dilemmas.

Julie's identity work centered on questioning whether her approach itself was the problem—a question amplified by her whiteness. When Kendra challenged the "post-secondary counseling" framing, she challenged Julie's understanding of herself as an advocate for racial justice. Julie remained open to the possibility that creating multiple pathways might hold students to lower standards. This openness, while reflecting important racial humility, also meant she struggled to trust her own judgment. Without colleagues to help distinguish productive self-reflection from paralyzing self-doubt, she cycled between believing in her approach and questioning whether she was failing students.

Yet Julie continued to navigate, making provisional choices even amid uncertainty. She taught rounding with genuine excitement about meeting Miya's needs while questioning whether this contradicted her beliefs. She implemented BTC practices despite discomfort, seeking resources to make them manageable. She remained in conversation with Kendra, learning from perspectives that challenged her own. By our last interview, Julie had transitioned into a leadership role, heading the high school programming and working alongside Kendra. In this position, she could make programmatic decisions and shape the professional development of newly hired mathematics teachers. In relation to her new role, she spoke about considering what resources that she would want teachers to read and how she can support them in providing "high-

level engaging content for students." Interestingly, her understanding of how best to support new teachers came down to what books and research they had access to that would help them teach mathematics in ways that aligned with the IB mission and the pedagogical frameworks that had inspired her. She did not mention any relational aspects of how she would engage with new teachers but the fact that she would have other high school mathematics teachers to work with was already a change to the conditions of isolation that she had experienced.

Julie's case shows that isolation makes it nearly impossible to distinguish structural impossibilities from personal inadequacies. Resources provide tools but require collaborative engagement to function as support rather than fuel for self-doubt. Like Julie, Carlos also navigated tensions between competing purposes, though his context and positioning created different stakes and strategies. As a teacher of Color working with students who shared his racial identity in a tracked mathematics program, Carlos's sense of responsibility was amplified by his awareness of how the system marginalized students who looked like him—shaping where he chose to invest his energy and which fights felt worth fighting.

Carlos

Finance math

It's just algebra
Algebra one word problems

Banking
Stock market
Loans
Basic finance stuff

The benefits of being
a not broke person

Managing finances
Understanding
credit, debt, mortgages

I bought my first home this year
The process was overwhelming
I wasn't prepared

If I can help them with that step
whenever they take it
That's massive

I just want to survive the year
I don't want to do it again

They've had 12 years of thinking
math is supposed to be this one thing
Memorizing how to do things

Their minds are set
They pick this class because it's
famously the easiest math class.
They come in not expecting to think

It's exhausting
To fight every day
To get them to think
'You're supposed to teach us.'

Everyday
Not even all of them. But the few
The same thing
'Imma wait for you, because you're
the teacher.'
The same fight

So you know what?
Let's just survive the year
I'm not doing this again

What do they get?
A gold diploma
A special category
For clout

The principal reads your name at
graduation
It's not challenging
It's the easiest math class

It's not calculus, AP computer
science, statistics
It just hurts them

Half of the seniors take Finance
Look at their names
I told her
The last names, compared to
calculus
It's not the same students
The same demographic

I know they can do things
I trust them
I just couldn't get through to them

The teacher trusting you
It has to happen earlier
Before you pick
the easiest math class
your senior year

Poem 3: Carlos

By the second semester of the school year, Carlos had reached the point where he just wanted to "survive the year" with his Senior Finance Math class. What had begun as an attempt to implement “vertical learning”—asking students to work through problems collaboratively before being given direct instruction—had become, in his words, "just a fight":

> I swapped it…At first, I didn’t want to do vertical learning in Geometry because they were a resource class. I was doing it in Finance but now it’s the other way around. Finance was just exhausting. I’ve been telling them that for every quiz and test, their averages have been lower as a class since they stopped using vertical learning. It just became a fight. It wasn’t even more of the students but even just the few were exhausting. They would be dramatic; ‘I’m not doing this.’ ‘I’mma wait for you because you’re the teacher.’ It was just too much. When I used it with the Sophomores, they were craving it.

The contrast with his Resource Geometry class—a course designated for students receiving special education services—is significant. Carlos had initially avoided vertical learning with the Resource class, uncertain whether he had the knowledge and skills to implement these practices while also accommodating students' disabilities. Yet it was with these students that the approach took hold. They were responsive, saw improvements in their grades, and met his expectation that they engage with problems before being told how to solve them. Even on days when he felt "I want to just stop seeing [the Sophomores] forever," he continued investing in the relationship by consistently demonstrating that he trusted them, and it paid off.

Finance Math occupied a particular institutional position at Carlos's school. Students who completed the course were eligible for a gold diploma—a distinction requiring four math credits, including an advanced course taken in their senior year. Finance Math counted toward this requirement, making it an accessible pathway to a credential that signaled college preparation. Yet the course carried a reputation as the easiest available option, and students selected it accordingly. While Carlos did not state this directly, his account implies that the course's designation as 'advanced' served the institution's interest in expanding access to the gold diploma without requiring students to engage with more demanding mathematics—a structural arrangement that, in his view, ultimately hurt the very students it appeared to reward.

That the exhaustion came specifically from Finance Math, and not from the more demanding context of the Resource class, points to something beyond student resistance or his own capacity. To Carlos, the problem was not that Finance students lacked capability or that he had stopped trusting them. It was that the Finance Math course had come to represent something larger, a pattern he recognized in the last names of his students, a demographic reality that sorted Hispanic students into the easiest math course year after year. Understanding why he chose to step back—and where he chose to invest his energy instead—requires sitting with what that pattern meant to him as a brown teacher who shared his students' cultural and linguistic background.

Identity binds: navigating racialized narratives about capability and choice

Throughout our interviews, Carlos drew on stories about himself to explain his attitude toward students. He knew that for many students, he was a role model because of their shared

identity. It was not that the White teachers in the school were bad, but "the language, the sense of humor, the references, the calling parents when they may not speak the language," all made a difference to how he was able to build community with students. He shared that he moved to the U.S. when he was about 12 years old and now has a house and a degree—he was a model of what his students could achieve if they believed in themselves. In many ways, his belief in what students could accomplish went beyond what he felt students actually expressed as a desire for themselves.

During our first interview together, we discussed the push to get more students, particularly Students of Color, interested in STEM fields. When I asked if he had ever wondered if his goals as a teacher were the right goals for students, he replied:

> Earlier, I thought that I needed these students to go into STEM; to want to be engineers and computer scientists and chemists. But they don't always want to do that. It doesn't mean they're useless or that they can't have good careers and be good citizens. It just means that they don't want to…In the late 2010s, there was a push for people to include minorities and women in STEM fields. And it's a good cause, but I feel like it felt forced. Students are not stupid. They are smart enough to make their own decisions. To see their talents and decide what they should pursue after high school. I myself was guilty of pushing students to want to go into STEM. But now, I think they should pursue whatever they want. We can't force them to do anything.

When I followed up to ask Carlos why he thought students were not choosing to go into STEM, he expressed the ways he had wrestled with this question himself. He shared that,

"Mexico is the country with the eighth most engineers in the world. So, it's not a stupid country; they do build smart people that are successful. And I was wondering, how come we don't have more Hispanics here pursuing engineering?" He felt that the urgency to "push" students toward STEM actually had the opposite effect but he still questioned why they were not more interested in pursuing STEM careers. Some of his family members suggested that immigrant families did not need as much income to live a good life in the U.S. Even his sister, an engineer herself, said that in the U.S., they do not have to push themselves as hard, suggesting that it was a matter of laziness. Carlos, however, refused to accept this: "I don't want to believe that, though. I think that's a very dark, very sad way of seeing ourselves as a community."

Although he determined that he was no longer going to push students toward particular career choices, Carlos continued to struggle with this tension. He wanted to support students in living up to the hopes he had for them—becoming sensemakers who would critically engage in the world around them. Even if they did not choose to go into STEM, this goal would at least support them in navigating their worlds, no matter their career choice. Using strategies from BTC could support this effort, offering a structure that promoted problem-solving and critical thinking while, in his experience, also contributing to higher averages on assessments. His acceptance of student choice made the resistance he received from a few of his Finance math students more frustrating because he wasn't trying to push them toward his goals anymore, he was trying to give them tools they could use for their own.

The ways that Carlos spoke about these few Finance math students paralleled how he spoke about his own frustrations with the Hispanic community in the U.S.: "Back to the election,

it was eye-opening just how the Hispanic vote turned out. It speaks to the lack of sensemaking, that they just get okay with because they never were pushed to make sense of things…. just waiting for algorithms, for rules or procedures, just waiting for there to be a boss." His language here was striking—positioning Hispanic students and voters as passive, as waiting to be told what to do rather than thinking critically. This could easily be interpreted as racial stereotyping, reproducing deficit narratives about Hispanic communities as lacking agency or intellectual rigor.

Yet Carlos's racial identity shaped how he understood and navigated these observations. His frustration was not rooted in beliefs about inherent deficiencies but in his awareness of how systems had failed to develop students as critical thinkers. He refused deficit narratives even as he grappled with the patterns he observed. The question for Carlos wasn't whether Hispanic students were capable—he knew they were—but why the system was not fostering that capability, and whether it was already too late by the time students reached his Finance class as seniors.

Carlos understood what appeared as student disengagement or desire for easy answers as a structural problem, not a cultural or individual one. Students had spent years being sorted into courses with lower expectations of them before they even reached Finance Math. The limited curriculum in Finance Math further reinforced low expectations through its repetitive, limited content. And the course's reputation as requiring minimal effort attracted students who had already internalized that they weren't "math people." As he had pointed out to his department lead, Hispanic students were disproportionately enrolled in Finance math rather than higher-level

courses like Calculus. Although Seniors who took the class received a gold diploma, Carlos felt that it was a disservice to students. That they were incentivized to take Finance, essentially a glorified Algebra 1 course, when other students were taking Calculus, AP math, computer science, and statistics, felt offensive to Carlos; “There are about 300 graduating seniors, about half of them taking that class. It’s just a waste of time for everyone.” For Carlos, who valued mathematics education as a tool for fostering sensemaking, Finance Math offered neither opportunities for sensemaking nor useful applications to Finance management. He experienced the course as the epitome of how the mathematics education system had repeatedly failed students.

When it came to his Geometry class, Carlos saw an opportunity to disrupt this cycle before it was too late. The students that he had been able to reach before taking Finance math had been more appreciative of his attempts to teach differently; they were not set in the idea that the teacher had to tell them what to do. And his sophomore students were “craving it.” These experiences reinforced his belief that students had to be pushed toward sensemaking early on in order for it to make a meaningful difference: “I feel like it has to happen earlier…before you pick the easiest math class your senior year.” Perhaps if he could invest his energy in convincing younger students that they were sensemakers who could do hard problems, fewer students would see Finance math as their best option.

For Carlos, the contradiction between wanting more for students than they wanted for themselves and accepting their choices wasn't experienced as uncertainty about his

responsibilities but as strategic navigation of where to invest his limited energy. He felt a responsibility to support students as sensemakers and foster their belief in themselves—but this responsibility felt most urgent and most achievable with younger students who had not yet been fully shaped by years of tracking and low expectations. The few resistant Finance students were not incapable; they had simply been taught by the system to expect less, and by their senior year, changing those expectations required a battle Carlos didn't feel he could win. He chose instead to invest in his Sophomore Geometry students, hoping to reach them before the system had convinced them they could not do real mathematics. This was not giving up on students but recognizing that systemic failure compounds over time, and early intervention may be more realistic than late rescue. Carlos understood the problem clearly: students had been failed by a system that sorted them, limited their curriculum, and reinforced low expectations. What remained less clear was whether his individual efforts—even strategic ones—could counteract structural problems that extended beyond his classroom. Yet he continued searching for ways to shift not just his own practice but his colleagues' beliefs about what students could achieve.

Resource binds: We know what we're supposed to do

Carlos' experience navigating resources was shaped by a supportive administration alongside relative isolation in his pedagogical commitments and frustration with colleagues who blamed students rather than examining their own practice. He described meetings with his colleagues as tending to focus on surface-level adjustments—modifying word problems, reviewing assessment data—rather than the substantive pedagogical conversations Carlos was looking for: "it's every year that we see the same thing, the same average, mostly the same set of

problems. What are we changing now? I feel like it's lackluster." The problem that he experienced was about his colleagues unwillingness to adapt and come up with new solutions which, to him, seemed to stem from a lack of passion for teaching: “I feel like, in my district, there's teachers who are not as proud to be a teacher…I feel like a lot of teachers see it as just, you know, it's eight to three, and then I'm not a teacher anymore. I don't read up, I don't do the homework type of thing.” He juxtaposed his experience with his school colleagues with other professional learning experiences that he engaged with in which he felt there was more collaborative efforts to learn and grow as professionals.

During his teacher education program, Carlos was a member of a professional organization for future teachers. He continued to engage with this organization, participating in mentorship and professional development opportunities and attending national conferences like NCTM with his cohort. He first discovered *Building Thinking Classrooms* (Liljedahl, 2020) as a recommendation from his mentor in the program and he promptly started implementing practices from it. Additionally, midway through data collection for this project, Carlos enrolled in a master’s program in mathematics education, which further enhanced his understanding of existing research on mathematics teaching and learning.

When it came to his experience teaching Finance Math, Carlos had used words like "depressed" and "sad.” But once he began taking classes and discussing mathematics education with other teachers enrolled in the master’s program he described feeling more “empowered.” He had more access to knowledge about what good teaching looked like within a community of

other teachers. When he described feeling "less depressed" and "more empowered" through his coursework, the empowerment he named was about not navigating alone.

His master's course also offered confirmation that the problem was not a lack of knowledge about what good teaching looked like. As Carlos reflected, "it's also a reminder that the research has been there for decades. This book that we read, *The Teaching Gap*, came out in the 90s, the same things that we learned and that we still talk about changing. So, we know what we should be doing, we just don't." This quote captures a key tension in Carlos's navigation. On one hand, it was empowering—the problem wasn't that teachers didn't know better, it was that, in his experience, they were not willing to invest in change. The knowledge existed; the research was clear; the practices worked. This meant change was possible if teachers would commit to it. On the other hand, this realization was deeply discouraging. If we have known what to do for decades and still aren't doing it, then Carlos's individual efforts—his workshop, his modeling of BTC practices, his success with students—might not be enough to shift his colleagues' commitments. The system continued to fail students but to Carlos this was not because information was lacking but because there was a lack of will. Resources like BTC and *The Teaching Gap* provided frameworks and evidence, but they couldn't make other teachers or the school system care enough to change.

By our final interview, at the beginning of the school year, Carlos shared that he was working with the math specialist at Red Rocks to establish a professional learning community focused on productive collaboration rather than the data-driven meetings and complaint sessions he found frustrating. His vision was for teachers to sit in on each other's classes, collect student

data together, plan rich lessons collaboratively, and debrief what they observed—creating cycles of reflection and revision rather than one-off workshops. He wanted to build a space where teachers could see what was possible with their own students, where they couldn't dismiss practices as unrealistic because they'd witnessed them working. As he described it, the goal was getting teachers "in this practice of writing better tasks for our students" through sustained engagement rather than surface-level professional development.

This vision was itself a response to unresolved tension rather than a path out of it. Carlos was attempting to build within his school the kind of community he had only found outside it—one defined by genuine commitment to students rather than compliance with institutional routines. But doing so required convincing the same colleagues whose resistance had exhausted him to invest in a fundamentally different way of working together. The PLC was not a solution but speculation: that sustained, concrete engagement might shift what professional development alone had not. Whether his colleagues would meet that hope remained entirely open.

Carlos's efforts reveal both the possibilities and limitations of resources in shifting practice. He sought out frameworks like BTC, engaged in master's coursework for a deeper understanding, and worked to create collaborative structures at his school through the PLC. These resources confirmed what he believed about students' capabilities and gave him tools to enact those beliefs. Yet resources alone—even decades of research, even clear evidence of effectiveness—couldn't resolve the fundamental problem: teachers had to be willing to change. He knew what good teaching looked like and had proof that it worked. But knowing wasn't enough when colleagues were not willing to invest in doing things differently, and when the

system that sorted students persisted regardless of individual teachers' commitments. Resources provided tools and confirmation but couldn't guarantee his colleagues' willingness or make systemic obstacles disappear.

Navigating strategically: choosing battles within structural constraints

By our final interview at the beginning of the following school year, Carlos shared that he was no longer teaching Finance Math and was instead teaching a college Algebra course, also for Seniors. He was relieved to no longer face the "depressing and exhausting" situation of trying to teach in ways that honored his goals for students while fighting to convince them they could do more than they had come to expect of themselves. Instead, he redirected that energy into establishing the PLC that could provide space for him and other teachers to work toward instructional goals that centered trust and sensemaking. Carlos chose strategically where to invest his time and energy so that he could sustain the work that was important to him and continue to grow as an educator. While he might have continued pushing Finance Math students to meet his responsibility toward fostering students as sensemakers, he understood that doing so was untenable and not worth the fight. This relief was not incidental—the emotional weight of feeling unable to reach students as he desired had been genuinely depressing and redirecting that energy toward spaces where change felt possible was as much an emotional necessity as a strategic one.

This same strategic logic shaped how Carlos navigated his responsibility toward Hispanic students more broadly. He recognized that his racial identity positioned him uniquely to advocate for students disproportionately sorted into lower-expectation courses—he had already raised the

demographic pattern with his department lead and understood that his shared background with students allowed him to build trust in ways that felt different from what White colleagues could offer. Yet he was deliberate about how explicitly he framed this advocacy with peers: “I don't want to seem like I'm pushing or focusing more on a certain demographic with my peers.” This was not avoidance but calculation—he was already fighting to shift deficit thinking, implement BTC despite pushback, and build a functional PLC. Adding an explicitly race-focused agenda would require political capital he didn't have. By framing his work around improving instruction for all students, he could pursue changes that would disproportionately benefit Hispanic students without opening a battle front he couldn't sustain.

Carlos's strategic navigation represents an approach to sustaining work that mattered within structural conditions that persistently resisted it. His understanding that, “we know what we should be doing, we just don't” captured both the empowerment and the discouragement at the heart of his experience: change was possible if teachers would commit, yet knowing wasn't enough when colleagues lacked the willingness and the system continued sorting students regardless. Carlos exercised meaningful agency within these constraints—but his case also makes clear that strategic individual navigation, no matter how carefully calibrated, cannot fully counteract structures that persistently fail students. For Carlos, emotion was not separate from this navigation but inseparable from it—the depression of feeling unable to reach students as he desired and the empowerment found in collaborative spaces where change felt possible both shaped where he chose to invest his energy and what felt worth fighting for.

Greta

When I started, I was more focused on content. *Not that I'm not*

But I feel like in terms of what kids learn

Everything matters Nothing matters

It doesn't matter where they're starting. It matters how they feel.

They will learn whatever content they need to when they have to.

I know when I say that, it might sound irresponsible

Sometimes there are things, I don't really know the applications,

but I never want to say,

I think it's irresponsible to say, "You all have to do this because you'll need it next year."

So I don't.

I want it to be inherently valuable when we're doing it. Right now.

But there are times

> Like absolute value. When will you use this? Honestly, I have no idea. But everybody learns it. I don't know who uses it. But a parent, the dad, he uses it every day in programming. Who knew? I have no idea how it's used. But I know that a programmer might use it. That helps me feel better about the application.

So I need to know, to help them see that

If I don't, I feel inept when I don't know how to justify what we're doing. Why?

We're teaching for a future we don't even know.

Everything matters. Nothing matters.

Poem 4: Greta

Like Becca, Julie, and Carlos, Greta navigated tensions between competing purposes for mathematics education and questioned what "responsible" teaching looked like. Yet her context created different conditions for this navigation. Where Becca faced high-stakes testing demands, Julie worked within an "IB for all" structure with limited resources, and Carlos confronted tracking systems that marginalized Hispanic students, Greta taught at a progressive private school with near-total curricular autonomy and a mission that aligned with her values. She did not have mandatory assessments or prescribed curriculum, and she had the freedom to prioritize student agency and sensemaking without institutional constraint. Yet even with this support, she experienced pressures from dominant narratives about mathematics education—narratives so pervasive that they operated even in contexts where they were not formally enforced. Her case reveals that institutional support, while crucial, does not eliminate the work of maintaining conviction about what mathematics education should accomplish when cultural expectations question whether such choices are "responsible."

Philosophy and the context that enables it

Democratic citizenship framed Greta's educational responsibilities. In discussing her goals as a teacher, she was highly focused on supporting students' sense of agency over their learning and confidence in their knowledge of self. Although she did have content-related goals that she wanted to meet, these goals were secondary to the social and emotional goals that she had for students. This was not just a matter of the age of the students that she taught (11–14-year-olds at a critical developmental age), but also about her personal educational philosophy and the mission of the private school where she worked.

To Greta, choosing and designing the curriculum was the responsibility of the teacher. Most of the curriculum used at Sparrow Lake was designed and taught collaboratively with a team of teachers who regularly adjusted plans to address the interests of their students and integrate science, social studies, and language arts. No bells or schedules told them when to switch to a different subject because their units thematically intertwined different disciplines to the point that they could not be disentangled. For example, a unit on food could cover the science behind cooking methods as well as the cultural and historical roots of different kinds of foods. The one exception to this comingling of disciplines was mathematics. This was the one class that had a scheduled block of time, and students were divided into age groups corresponding to their appropriate grade level. Greta was responsible for teaching the oldest students, the would-be 8th graders, in their final year of mathematics before transferring to a high school, which, for many students, would be a public school. Because of Greta's autonomy over the content, she was able to teach in ways that were responsive to students' interests and could cover topics in greater depth, without the same time and content pressures as Becca, Julie, and Carlos.

A class I observed at Sparrow Lake exemplified how Greta's philosophy translated into practice. The lesson revolved around a single worksheet that Greta had made by hand and photocopied, in which students, working in pairs, measured the height and tread of different staircases in the school building. The lesson started with a brief conversation, which Greta initiated with the question, "Why do we have stairs?" Eventually, students began discussing different kinds of stairs and what made them easier or harder to climb, which turned into a conversation about how to measure slope—a topic previously covered—and how that related to

building codes about the steepness of stairs, ramps, and ladders. Students shared their knowledge of slope and questioned how to account for different components of the stairs, like the landing zone between staircases. During the conversation, Greta hardly contributed any direct answers and instead engaged with their questions as they decided what to do in these instances. After, the students were released from the classroom to move about the building in randomized pairs and compare their measurements to the different building codes listed on the worksheet. Greta walked around the building, checking in with different pairs, asking them questions about what they had observed, and challenging their thinking when relevant. The short lesson (about 35 minutes) ended abruptly without having time to discuss the results, though she indicated they would follow up during the next lesson.

In speaking to Greta about this activity, she expressed that the mathematics used was rather simple in terms of content, perhaps acknowledging that it did not quite meet Algebraic content standards extending beyond 8th-grade mathematics. However, she liked it because it was hands-on and prompted students to make connections between mathematics and their worlds. I also noticed how independently students were able to work. During most of the lesson, Greta only had about two students in sight at any one time. Sure, the school building was rather small and there were plenty of adults around, but it was clear to me, as an observer, that students were accustomed to working without much oversight from their teacher. Considering the importance of agency over learning that Greta had named as important, this struck me as a prime example of how that sense of agency was reinforced by the culture of learning in her class.

When Greta spoke about this lesson and about her teaching philosophies, she displayed excitement about the kinds of questions that students asked and the debates they got into in class. She loved it when students disagreed about things and when they could evaluate their understanding for themselves. What she hardly emphasized was the specific content students were expected to learn—her focus remained on their agency, their ability to navigate unknowns, and their developing sense of themselves as learners and mathematical thinkers.

This context—a progressive school with a mission aligned with her philosophy, near-total curricular autonomy, collaborative planning structures, and freedom from standardized assessments—gave Greta what the other three teachers lacked: institutional support to prioritize sensemaking and student agency without compromise. Yet as the following section reveals, even this level of support could not eliminate pressures from dominant narratives about what mathematics education should accomplish and what "responsible" teaching looks like.

Persistent pressures

Even at Sparrow Lake, dominant narratives about mathematics education operated with enough force to make Greta question whether her choices were "responsible." These narratives didn't arrive through institutional mandates—there were no required assessments, no prescribed curriculum, no content standards to meet. They arrived instead through cultural expectations so pervasive that they shaped what felt professionally defensible even in a context explicitly designed to resist them. They came from outside the school—in parents' comparisons to district peers and assumptions about content acceleration—and from within it—in newer colleagues who increasingly wanted the simplicity of prescribed curriculum over the complexity of open-ended

problems. In both cases, the pressure was the same: a dominant story about what mathematics teaching should look like, powerful enough to operate even where nothing formally required compliance.

When Greta shared that her focus remained on students' agency and self-knowledge rather than specific content coverage, she immediately added: "I know when I say that I might sound irresponsible." Despite her strong sense of pedagogical responsibility and the institutional support that allowed her to prioritize what she valued, Greta was concerned about how others might view her teaching as insufficient. In particular, she expressed frustration about the trend that students were being taught Algebra I at younger and younger ages. 8th-grade Algebra had become such a common expectation in the district that students who did not complete an Algebra 1 course before starting high school were seen as behind. At Sparrow Lake, there were no tracked math classes—students were simply divided by age. Just as in any other math class, the students in Greta's class had differing levels of mathematics understanding. In another school, many would probably be placed in Algebra 1. In fact, one student was independently supplementing her class by taking an online pre-calculus course yet still participated in Greta's lessons.

To Greta, this wasn't a problem. Without requirements to meet specific Algebra 1 content standards for every student, she could focus on the depth and relational aspects of mathematics most important to her. By helping students develop agency as sensemakers and an understanding of themselves as learners, she believed they would be prepared for whatever math course they chose in high school—they would know how to advocate for themselves and find resources they

needed to learn unfamiliar material. Content mastery could come later; what mattered was that students left "feeling like a mathematician, no matter what class they take next year."

Yet the pressure persisted. Parents expressed concern that their children weren't at the same level as peers taking Algebra 1 in 8th grade. One parent in particular came to mind. He was Physics teacher at a local high school whose child was currently at Sparrow Lake. A student who he had taught had also graduated from Sparrow Lake and the father had expressed concern that "the former student wasn't prepared enough to be with his peers in math." According to Greta, this student had been one of "the most brilliant thinkers" she'd had and started off in Geometry in high school. According to this father, this was not enough; he should have started in Algebra 2 given his mathematical knowledge and Sparrow Lake had not prepared him well enough. I myself expressed confusion at this notion—that it was Greta's responsibility to ensure that one student was academically prepared to be two years ahead of his peers. Greta also disagreed with this logic, but it was this kind of thinking that made her wonder whether others viewed her choices as irresponsible—whether prioritizing students' sense of themselves as learners over content acceleration meant she was failing to prepare them adequately.

Greta did not want to hold her students back from opportunities—just as Becca said, Greta too wanted to "keep doors open." She was deeply aware that mathematics is a gatekeeper and that to adequately prepare students she sometimes had to expose them to content that she did not necessarily see the value of herself. But if some students did not master every concept that was okay because they each had their own path ahead of them. By focusing on their agency as learners, they would have the mental tools necessary to learn what they needed to when the time

came. But when parents, like the Physics teacher, still felt that she was not doing enough, it led her to wonder if there was something she was missing. As she shared,

> I'm wondering, are things changing more? Are kids starting in Algebra 2 now and I'm not—I don't think that's responsible, I don't! This kid is brilliant in a really cool way and he's really thinking about things. He'll do all that on his own, regardless of what class he's in…. now his son is here and, without asking him anything, I keep wondering, does he have some expectations now? Is he going to scrutinize our math? ...If society is moving in these certain ways and I disagree with them, am I being irresponsible by not preparing them for a world that's outside of these walls even if I don't agree with it?

This question—whether prioritizing her convictions over external expectations was itself a form of irresponsibility—ran through her navigation of curriculum more broadly. Teaching absolute value was one small but telling illustration. She knew it was content that students at this level were expected to learn, but she couldn't see its application herself. This made teaching it feel like compliance with external convention rather than genuine responsiveness to students. Without knowing why it mattered outside her classroom walls, she felt, in her own words, 'inept.' It was a parent's offhand mention of using absolute value daily in programming that gave her the foothold she needed. She still didn't fully understand how the programmer used it, and most of her students might never write code. But knowing that someone, somewhere, used it professionally was enough—it meant that by teaching absolute value she was meeting a responsibility to prepare students for a world beyond Sparrow Lake, even if she couldn't map exactly what that world would look like for each student.

Greta craved having curricular autonomy that allowed her greater flexibility to be responsive to her students, but that autonomy did not come with certainty about what to teach—it required her to justify her choices without institutional guidance, creating its own form of vulnerability. Yet not all teachers at her school felt that vulnerability was worth it. While Greta viewed curriculum design as a core professional responsibility, she was frustrated to find that newer teachers at Sparrow Lake increasingly wanted a prescribed curriculum that told them what to teach rather than embracing the flexibility and professional judgment their context allowed. To Greta, this represented teachers abdicating the responsibility that made progressive education possible. When some teachers asked, "Why reinvent the wheel?" Greta responded, "Because whoever's using the wheel is different every time."

She wasn't advocating that teachers design everything from scratch. Until recently, they had been using Math in Context (MiC), a curriculum designed to engage students in contextualized problems rather than procedural practice—exactly the kind of resource that aligned with Sparrow Lake's philosophy and that they had freedom to use because they weren't required to meet set content standards. However, MiC was "much harder to teach" precisely because of its contextualized nature. Teachers had to support students in thinking through multiple factors of a situation rather than guiding them toward a single correct mathematical approach. This required deep engagement with the curriculum—working through problems themselves, anticipating where students might struggle, and understanding the multiple strategies students might use.

When newer teachers struggled with MiC's complexity, rather than investing in learning to use it well, they wanted simpler materials. The students, in turn, responded to these teachers' struggles with their own frustration. As Greta described, "the students hate MiC. They really would get excited about a worksheet. It makes so much sense and they're more comfortable." The newer teachers' difficulty navigating MiC led students to prefer straightforward worksheets over the contextual problem-solving MiC was designed to foster. To Greta, the solution was for teachers to do the professional work of deeply learning the curriculum—working through student materials themselves, understanding their own thinking processes, and anticipating confusion. But if newer teachers wanted easy-to-follow materials—whether that meant finding any curriculum to simply implement or abandoning MiC for worksheets—they were giving up the professional judgment and complexity that distinguished Sparrow Lake's approach from traditional schooling.

What made these tensions particularly striking was that they emerged in a context explicitly designed to support the kind of teaching Greta valued. Sparrow Lake's mission aligned with her philosophy. The school structure provided autonomy over curriculum. There were no mandated assessments or content standards to meet. Yet even here, dominant narratives about mathematics education operated with such force that Greta still had to defend her choices—to parents who measured preparedness by content acceleration, to district expectations that positioned students as "behind" if they hadn't completed Algebra 1 by 8th grade, and to newer teachers who wanted the simplicity of a standardized curriculum or worksheets rather than the complexity of responsive and contextualized teaching. These weren't institutional mandates

Greta had to navigate around; they were cultural expectations so ubiquitous that they shaped what felt "responsible" even in spaces designed to resist them. The pressure came not from policy but from the pervasiveness of these narratives about what mathematics teaching should look like—narratives powerful enough to operate even where nothing formally required teachers to comply.

Navigating with conviction: Philosophically grounded decisions

When I asked Greta to consider, of all the responsibilities that we had discussed, which did she feel the most personally responsible for, it was an impossible task:

> They all do. You're thinking about all of it. You're thinking about the content itself, but you're also thinking about every single human and how is, whatever *this* is, setting them up? Setting them up for the next problem, or the next thing that they're facing. I do think a lot about what we're doing in math. How can they walk away and apply that elsewhere? Not just in math.
>
> And the way for that to become meaningful, it's all of these other things: Who are they? What kind of biases exist within math, or that they bring to math that we need to actually examine and critique? All of that, it all just blurs. And I think all of these different things show up on different days depending on what's going on. Sometimes you show up thinking, I'm really focused on this content idea, and I'm really going to focus on just these two people here, because I know where they're struggling. And then that doesn't happen at all, because other things are happening.

> And so that flexibility is really important. If I go into teaching thinking everything matters—and I can't do it all the time, so I'll always have a plan—but how do I responsibly never do that plan and know that I'm still achieving all of these responsibilities?

Her repeated mantra, "everything matters, so nothing matters," did not indicate resignation to uncertainty; it acted as a reminder that there is freedom in not knowing. It both allowed her to be responsive to students by seeing everything as having significance and offered reassurance that when she inevitably couldn't do it all, she had to make the best decision she could in the moment. Central to this philosophy was her belief that she couldn't fully prepare students for a future she couldn't predict. No one knows what the world will look like when her students are adults, what knowledge will matter most, what challenges they'll face. What they most need, she believed, is to be prepared to navigate the unknown—to develop comfort with uncertainty, confidence in their ability to learn what they don't yet know and an understanding of themselves as learners. This drove her focus on agency and self-knowledge over content coverage. If students could "step into the unknown and then exist not knowing," if they could "feel more comfortable not being sure, and then come up with ways to help [themselves] feel more sure," then they would be prepared for whatever came next, regardless of which mathematical content they had mastered in 8th grade.

The pressures she felt to meet content standards, respond to parents' concerns that their children would fall behind, and use more structured curriculum were additional factors telling her what mattered. To make sense of her responsibilities in relation to these different pressures,

Greta oriented herself toward her own convictions as the primary basis for decision-making. These other perspectives added information to inform her choices—exposing students to content so they would have some familiarity with it, for instance—but her autonomy allowed her to choose when to accommodate others' desires and when to follow her pedagogical commitments.

Her emotional experience differed meaningfully from Becca's, Julie's, and Carlos's—not because Greta was indifferent to dominant narratives or unmoved by parents' concerns, but because her structural position meant those emotions didn't carry the same weight. The doubt captured in the poem's small-text asides—'I know when I say that, it might sound irresponsible,' 'but there are times'—express real uncertainty but are not debilitating. Crucially, when parents raised concerns about content acceleration or preparation, Greta could fall back on a structural reality the other teachers did not have: Families had opted in to Sparrow Lake knowing its progressive model. That choice gave her a legitimate basis for trusting her own expertise over parental pressure—not dismissively, but with the confidence that her pedagogical commitments were what families had originally opted into and were consistent on some level with their own values. She could feel the pull of external expectations without being destabilized by them. Emotion shaped her navigation, but her context meant it functioned as a gentle pressure rather than an impossible burden.

Unlike Becca, Julie, and Carlos, Greta didn't have curricular standards she was mandated to follow. She didn't have to use assessments or homework to evaluate student understanding, and she had access to social resources through working in a collaborative environment. Yet her case demonstrates that tensions teachers confront around their responsibilities don't disappear

even with supports in place. All four teachers navigated dominant narratives about what "responsible" teaching looks like. Becca worked to prove sensemaking approaches could succeed despite testing pressure. Julie questioned whether creating multiple pathways was responsive teaching or lowering standards. Carlos made strategic choices about where to invest energy when colleagues resisted change. And Greta maintained conviction when nothing formally required her to compromise—yet cultural expectations still exerted pressure. Her case reveals that institutional support matters but does not eliminate the work of navigating competing narratives. When expectations about content coverage, acceleration, and what mathematics education should accomplish are ubiquitous, teachers experience them as legitimate questions about their responsibility even in contexts that don't formally enforce them. In each case, responsibility was not received by these teachers as a fixed set of obligations but actively constructed through the tensions they navigated and the convictions they brought to that navigation.

Impossible binds, varied navigation: What the cases reveal together

Across the four cases, teachers' contexts varied considerably—between testing pressures and autonomy, isolation and collaboration, different racial positioning, and unequal access to social and structural resources. Despite these differences, all four teachers faced impossible binds: situations where competing responsibilities could not be honored simultaneously. Their navigation of these binds was neither arbitrary nor purely personal. It was shaped by who they were, what resources they could access, and structural conditions they could not control—ongoing work that was simultaneously cognitive, emotional, and relational.

Several threads ran through all four cases in ways that exceeded what any single case could fully illuminate. How teachers made sense of competing purposes—and what frameworks were available to them for doing so—shaped what responsibilities felt salient, urgent, and legitimate. Their identities—both how they understood themselves as teachers and how their racial positioning situated them within the communities they served—shaped what they noticed, what felt urgent, and whose judgment carried weight in ways that couldn't be separated from the responsibilities themselves. Running through all three patterns was the emotional texture of teachers' navigation—not as a separate dimension but as part of how each pattern was experienced and enacted. Emotion informed what felt sustainable, what felt urgent, and what choices felt justifiable, functioning not as a distraction from pedagogical responsibility but as inseparable from it. And resources provided tools for navigation while simultaneously shaping—and sometimes deepening—the uncertainty teachers experienced.

These threads are examined in depth in the following chapter. What the cases make clear as a starting point is that pedagogical responsibility is not a matter of identifying correct priorities and implementing them faithfully. Teachers made provisional choices within impossible binds, knowing there was no right answer. They exercised agency not by transcending structural constraints but by navigating within them; honoring some responsibilities while necessarily letting others go. The implications of this reality for how we understand and support teachers' work are explored next.

Chapter 7

Holding Themselves Together:

Moral Judgment, Emotional Labor, and the Conditions of Navigation

This study began by asserting that the purposes of mathematics education are contested and that mathematics teachers' experiences of the tensions that shape their work matter to their sense of pedagogical responsibility. By drawing on theoretical perspectives highlighting the role of identity, emotions, and resources in teacher sensemaking, the findings contribute to an understanding of teachers' sensed responsibility, revealing the affective narratives through which teachers make sense of and justify their choices, the identity binds that emerge when competing commitments to who they are come into conflict, and the resource infrastructures that shape what support is and is not available to them

When teachers' pedagogical responsibilities are presumed to be passively received and implemented, we lose sight of how teachers themselves construct these responsibilities as competing, through their experiences of teaching dilemmas and the factors that shape their provisional decisions. By understanding how teachers make decisions that are not only cognitive but also emotional, we—as education researchers and teacher educators—are called to reconsider what we ask of teachers when we prescribe visions of "good teaching" without accounting for the labor of navigating competing purposes that cannot be fully reconciled. Across the spectrum of mathematics education research, whether promoting dominant or critical visions of mathematics, there is a tendency to treat everything as possible. You can teach critical and social justice mathematics, *and* cover all the standards, *and* center students as agentic sensemakers—

you just have to learn to do it right. The goal post continues to shift and turn in on itself, constantly offering more expansive visions and thickening the moral burden of teaching. While it's important to expand and challenge narrow ideologies about what mathematics teaching and learning should be, it is also necessary to consider how teachers experience the variety of perspectives offered.

While I believe that the findings discussed here are relevant to teachers of most any discipline, I emphasize the experiences of teaching mathematics because of the stakes involved. As the teachers in this study and education scholars have made clear, mathematics education holds a position of power in society, requiring that teachers take responsibility for how they support students in learning institutionalized standards of knowledge and skills used to evaluate their ability to succeed. These same systems have reified social stratification and racial hierarchies by positioning certain students as mathematically capable and others as deficient in ways that map consistently onto racial and socioeconomic categories. Mathematics teachers face dilemmas between preparing students for the existing system and challenging that same system in ways that are highly consequential for students.

This point is certainly not new. Yet the intricacies of the moral dilemmas teachers experience and the emotional tenor of navigating this system are frequently overlooked. Existing scholarship has been driven by the aim of understanding teachers' sensemaking in the context of their collegial interactions within professional learning communities and inquiry into classroom problems of practice (Horn & Little, 2010). This study has taken a different approach. By centering my analysis on teachers' experiences of their varied responsibilities—as revealed in the

narratives they draw on to highlight key dilemmas and uncertainties—I aimed to foreground what makes these tensions feel irresolvable and what Lampert (1985) describes as the ongoing work of holding conflicting parts of oneself together. In this final chapter, I examine these findings through the lenses of identity, emotion, and resources, asking what it would mean to take seriously the moral and emotional dimensions of teachers' work in building toward transformative visions of mathematics education. Ultimately, this study is addressed not only to those who research and prepare teachers, but to teachers themselves—as an attempt to name what they already know: that the tensions they navigate are real, structural, and not theirs to resolve alone.

Holding Themselves Together: How Teachers Respond to Identity Binds

Becca questions, “Who am I to say?”, Julie asks, “Is this a me problem?”, and Greta notes, “That might sound irresponsible.” These are moments when these teachers reveal how their identities as good teachers may be at risk. In their experiences of pedagogical responsibilities, teachers are not just facing dilemmas about micro-interactions with students or colleagues but also about the very meaning of their work and how to sustain a positive self-identity within structural conditions that force them to contend with the fact that they cannot do it all.

Each teacher experienced challenges to their identity as good teachers that arose within their sense of responsibilities as varying and conflicting. In response to those identity binds, teachers drew on narratives that allowed them to preserve an emotionally sustainable teaching experience in which they saw themselves as doing morally good work—work that revolved

around their relational responsibilities of care and trust and their responsibility to develop students as sensemakers. For Becca, her intentional framing of student belonging as both academic and emotional stood as a counterweight to the expectations of test-driven direct instruction. Julie drew on stories of working with students who were "behind" by academic standards—finding moments of joy and meaning that challenged the assumptions of IB for all and college trajectories as a singular standard of success. Carlos actively invested in trusting his students as a means of disrupting the deficit and racialized narratives they were exposed to elsewhere. And Greta adamantly insisted on the value of fostering students' agency even if it got in the way of their content knowledge. These narratives were not just challenges to external pressures but also a way for them to sustain their "good teacher" identities by attuning to the moral rewards of care for students.

These choices were not simply matters of personal preference or choosing their own satisfaction over student needs. Teachers foregrounded the responsibilities that satisfied their sense of self—allowing them to be the teacher they saw themselves as (Lampert, 1985). In this way, the teachers in this study managed responsibility dilemmas by making provisional choices that did not resolve the root cause of the tensions they experienced but allowed them to tune into their moral agency (Santoro, 2016) to make decisions that they felt were in the best interest of their students and themselves.

It is worth recognizing how teachers navigate their identities as a way of coping with the demoralizing conditions of their work. Demoralization, as described by Santoro (2011), refers to the consequences of structural conditions that hinder teachers' access to the moral rewards of

teaching. This makes it increasingly challenging for teachers to find joy and purpose in their profession, risking teacher attrition. The responsibility dilemmas that teachers in this study articulated are a clear manifestation of the demoralizing conditions that Santoro describes. In each case, teachers identified the structural conditions surrounding their pedagogical work that made it difficult for them to maintain the belief that their work was morally good. However, rather than simply being discouraged and stagnated by these conditions, there is evidence in these cases of how teachers find opportunities to sustain their sense of self as good even in the face of obstacles.

Becca and Carlos offer clear and distinct examples of this. In Becca's case, she experienced direct instruction geared toward increasing students' test results as morally depleting. Yet she also understood that test scores had tangible value for students and their families that could not be ignored. Her sense of herself as a good teacher, who fostered students' mathematical belonging and sensemaking *and* ensured their access to institutional opportunities, required her to make pedagogical decisions that contributed to test-based outcomes while finding opportunities for her instructional preferences that held moral significance. Her response is marked by provisional choices that allowed her to use pedagogical methods that were otherwise incompatible with her moral values (such as direct instruction) while still sustaining her sense of self as committed to a vision of mathematics instruction that centered student thinking and fostered their emotional sense of belonging.

Carlos faced a dilemma between his responsibility to promote students' mathematical sensemaking and his inability to fulfill his pedagogical commitments within the constraints of

the Finance Math course. The conditions of Finance Math—a course students selected assuming it would be easy, which functionally sorted students into racialized ability groups—were demoralizing in Santoro's (2011) specific sense: they made it structurally impossible for Carlos to access the moral rewards of teaching without participating in the deficit narratives he understood himself as working against. Staying meant complicity. Leaving was therefore not only an act of self-preservation but an act of resistance—a refusal to occupy a structural position that required him to reproduce harm to students who shared his racial identity. By redirecting his energy toward developing students' mathematical identities earlier in their schooling, he reoriented both his practice and his moral investment toward conditions that allowed him to honor this responsibility more fully.

Carlos and Becca's choices demonstrate instances where teachers exercise agency in handling responsibility dilemmas. By making provisional choices, they manage to uphold their commitments to responsibilities that are otherwise structurally constrained. Greta also demonstrates agency in her pedagogical choices by prioritizing students' mathematical identities and self-knowledge over Algebraic content coverage. She encounters pressure from external structural conditions that cause her to question her choices as morally good, wondering if she should be doing more to prepare students. However, the context of her work—teaching in a private school with curricular autonomy and parental opt-in to a progressive education model—permits her to enact her own judgments with fewer moral repercussions.

Julie's case, conversely, offers a glimpse into the experience of feeling stuck within demoralizing conditions. Julie's experiences of identity binds frequently produced questions

about her own adequacy: whether her inability to differentiate instruction effectively reflected a failure of skill, whether her discomfort with IB for all reflected a failure of commitment to the mission, and whether her uncertainty about multiple pathways reflected a failure of perspective. Despite her awareness of the structural conditions impeding her ability to teach in ways that aligned with her sense of responsibility, she continuously framed resolution in terms of developing her own expertise, being better prepared, or challenging her own racial biases. The point here is not that Julie's responses are ill-conceived but that they are indicative of an embodied sense of *responsibilization.*

Responsibilization refers to the phenomenon where responsibility discourses create a sense of personal accountability for systemic failures (Kuhlmann, 2022). Although Julie could name the structural conditions that shaped the tensions she experienced—an IB for all mission that admitted all students while maintaining college-preparatory expectations without adequate support—that recognition did not interrupt her return, again and again, to questions about her own adequacy. Structural clarity and self-blame coexisted without the former relieving the latter. While Julie did discover opportunities to access moral rewards that were otherwise denied—finding joy in one-on-one work with a student who required accommodations—these opportunities were often limited to isolated cases that failed to alter the underlying conditions that shaped her self-perception.

In the following section, I articulate how the resource infrastructure that Julie experienced may have limited her opportunities to enact moral agency in the same way as other participants because of her relative isolation as the only mathematics teacher at her school.

In different ways, each teacher worked to access moral rewards that the institution withheld—not by resolving the root of the tensions they faced but by finding conditions under which those tensions felt sustainable rather than demoralizing. Yet these strategies were only as sustainable as the resources available to support them. But the resources most readily available to teachers—frameworks promising implementation solutions to what were in fact structural contradictions—operated within a different logic entirely.

Structuring the Navigation: Contextual Conditions Shaping Teachers' Responses

The responses available to teachers—and the emotions that accompanied them—were structured by the conditions of their contexts in ways that made certain responses possible and others foreclosed. This section examines three conditions that shaped those responses most consequentially across the four cases: the stakeholder relationships that made teachers' visions of good teaching contestable; the resources teachers engaged with and the interpretive frameworks those resources made available or withheld; and the racial positioning that shaped what teachers noticed, what felt urgent, and what relational support was structurally available to them. Together, these conditions produced the uneven terrain within which teachers navigated identity threats—determining not only whether teachers experienced uncertainty as manageable or demoralizing, but whether the conditions for sustainable navigation were theirs to inhabit or theirs to build.

Stakeholder Challenges and the Negotiation of Authority

Teachers' identities as "good" are not formed in isolation—they are continuously negotiated in relation to the discourses surrounding what it means to be a good teacher and the stakeholders who carry competing expectations about what that means (Horn & Garner, 2022). For the teachers in this study, interactions with parents, administrators, and colleagues frequently surfaced as identity-implicating moments—not simply external pressures but encounters that forced teachers to defend their vision or absorb doubt about it. What determined which response was available was not individual conviction alone but the resource infrastructures that supported teachers in holding their ground.

Becca and Greta both described challenges from parents who questioned whether their approaches adequately prepared students. These challenges produced genuine uncertainty—both teachers questioned their responsibilities toward teaching specific content and skills used to evaluate students' mathematical ability. Yet each managed to take these challenges as occasions for reflection without losing conviction about their vision. What made this possible was not simply their commitment but the relational and structural conditions surrounding them. Becca drew on her relationship with her co-teacher Jeremy as a consistent source of support, and on the memory of her former department chair's reminder that the test was not an adequate measure of good teaching. Relational resources allowed her to hold parent concerns alongside, rather than instead of, her own pedagogical judgment. Greta's context offered a different form of support: working in a private school without mandated curriculum gave her the moral agency to take parent concerns seriously without feeling compelled to subordinate her vision to them. Neither

teacher was immune to doubt, but both had conditions that prevented doubt from becoming destabilizing.

Carlos's experience with colleagues who resisted student-centered approaches built on trust reveals a different dimension of how stakeholder dynamics shape the conditions of navigation. The absence of shared commitments among colleagues was not just professionally frustrating; it isolated his interpretations of students' potential from any relational confirmation, leaving him to sustain his moral investment without the collegial infrastructure that Becca and Greta could draw on. Carlos responded by seeking relational support outside his school—through his master's program and reconnecting with his undergraduate mentor—finding in those relationships the interpretive confirmation his immediate context withheld. Ultimately, he redirected his energy toward changing the conditions within his school itself, establishing a mathematics teacher professional learning community aimed at building the collaborative infrastructure he had been navigating without. His case suggests that when institutional conditions fail to provide relational support, some teachers do not simply absorb that absence—they work to restructure the conditions that produced it.

Julie's situation combined elements of both dynamics in ways that made navigation particularly difficult. Kendra's challenge to her post-secondary counseling framing was not simply an administrative directive but an identity-implicating moment that forced Julie to question whether her vision of student-centered pathways reproduced rather than challenged inequity. Unlike Becca, who had Jeremy to help her metabolize similar challenges, Julie faced this question largely alone. The structural conditions of her context compounded this isolation in

a specific way: her school's IB for all mission carried a genuine commitment to universal high expectations that Julie shared, but its open admissions practice meant enrolling students whose preparation, circumstances, or trajectories made those expectations structurally unreachable for some. The mission's internal logic was contradicted, placing Julie in the position resolving that contradiction through pedagogy alone. How the resources Julie turned to shaped—and failed to shape—her navigation of these conditions is taken up in what follows.

What Resources Make Visible, and What they Conceal

Santoro (2011) observes that teachers' dilemmas are frequently rendered apolitical—"cast as *personal* struggles rather than as revealing problems within the practice of teaching" (p. 9)—thereby obscuring the structural conditions that produce them. Many of the resources most readily available to teachers operate within this logic, offering implementation solutions premised on the assumption that the right combination of strategies and frameworks can resolve what are in fact structural impediments. The language teachers used when resources failed is telling: "Is this a me problem?" "Who am I to say?" "We know what we should be doing, we just don't." These are not expressions of confusion about what good teaching requires—they are expressions of self-location, of teachers placing themselves, or other teachers, as the site of a problem that is structural. When resources premised on implementation solutions fail to deliver, they do not leave an interpretive gap that sends teachers looking for structural explanations. They leave teachers with a question about their own adequacy. In this way, the resources meant to sustain teachers against demoralization instead reproduced its conditions—locating the problem

in individual implementation rather than in the moral and ethical terrain teachers were actually navigating.

The resources teachers engaged with did not exist in a neutral field—they were organized around particular visions of what mathematics education is for each carrying its own account of what responsible teaching requires. As the literature reviewed in Chapter Two established, distinct frameworks of educational purpose imply distinct teacher responsibilities: a framework centered on student thinking positions teachers as designers of conditions for inquiry; a framework centered on equity positions teachers as interrogators of whose knowledge counts and who has access; a framework centered on college readiness positions teachers as preparers for institutional gatekeeping. These are not simply different emphases—they can pull in genuinely incompatible directions, making demands that cannot all be honored simultaneously.

Teachers in this study did not typically name this competition explicitly. What they experienced were its effects—the sense that meeting one set of responsibilities made another harder to honor, or that a resource that helped in one dimension of their work created new tensions in another. Becca came closest to naming the dynamic directly, describing how encountering different frameworks across mathematics education research and research on teaching students with disabilities offered different lenses and different theories about what works. Rather than positioning these frameworks as competing, Becca described them as relieving some tensions associated with feeling that there was one "right" way to teach because the contrasting theories revealed "more nuance". Rather than experiencing the contradiction as evidence of her own confusion, she was able to read it as confirmation that no single approach

could resolve fundamentally competing purposes. The collaborative infrastructure surrounding her—her co-teacher, her professional learning community—gave her a relational context within which contradictions could be named as structural rather than absorbed as personal. For the others, the competition between frameworks remained largely implicit—visible in the tensions they navigated but not in their language about resources themselves.

This gap between the interpretive competition among frameworks and teachers' experience of its effects is itself analytically significant. It suggests that the burden of navigating competing educational purposes falls on teachers without the field necessarily equipping them to name what they are navigating. Resources offer visions of good teaching without always acknowledging that those visions are partial, contested, and in tension with other visions—leaving teachers to absorb the friction between them as a feature of their own practice rather than of the landscape they inhabit. For teachers without relational infrastructure to help name that friction structurally, the experience of competing frameworks does not produce relief—it produces a particular kind of confusion that has nowhere to go except inward.

This dynamic was particularly visible in a moment where Julie struggled to articulate her approach to differentiation. She wanted to describe creating space for students who might not be on a college trajectory while still finding mathematics meaningful and accessible—but she could not find language for this that did not feel like a betrayal of her commitment to believing in all students' mathematical capabilities. Catching herself on phrases like "highest achievers" and "low-achieving students" and quickly disclaiming them, what became visible was not a linguistic problem but a philosophical bind: she had internalized two competing narratives that the field of

mathematics education has not fully reconciled—one telling her that all students deserve and are capable of rigorous mathematics, another telling her to meet students where they are. Scholars of mathematics education have done substantial work challenging tracking and deficit narratives about students' capabilities (Boaler, 2011, Gutiérrez, 2008) but it has been considerably less attentive to the pedagogical problem that follows: what does a teacher do when content is premised on prerequisite knowledge some students don't have? The discourse offers a moral commitment without a structural solution, and Julie was living in the gap between them—without colleagues to help her name that gap as the field's problem rather than her own.

A related but distinct dynamic emerged when teachers engaged with resources premised not on competing interpretations but on a single, uncontested account of what the problem of mathematics teaching is and how to solve it. BTC is the clearest example among the resources all four teachers engaged with. Its framework is coherent and internally consistent: the problem is that students are not thinking; the solution is to change the classroom conditions that prevent thinking; the practices it offers are designed to produce those conditions. Within this logic, failure to achieve the promised outcomes—students thinking deeply while moving through content efficiently—has only one available explanation: the teacher has not yet implemented the practices correctly, or consistently enough, or in the right combination.

What makes this consequential is not that BTC's framework is wrong but that it is incomplete in a specific way. The goal of getting students to think—however worthwhile—is not the only purpose mathematics teachers are responsible for meeting. Standardized assessments evaluate content knowledge rather than thinking processes. Institutional structures shape what

kinds of thinking are possible in a given classroom. Families carry expectations about preparation for college trajectories that open-ended inquiry does not always satisfy. These are not implementation problems—they are structural conditions that BTC's framework has no language for, because its account of the problem of mathematics teaching has already resolved them by omission. As Apple (1992) observed of equity discourse more broadly, frameworks that offer a coherent solution to a selectively defined problem risk functioning as slogan systems—providing the appearance of resolution while leaving the deeper structural tensions intact.

Becca's engagement with BTC illustrates this dynamic clearly, precisely because she had the relational infrastructure to navigate its limitations without being destabilized by them. She participated in a professional learning community where teachers did not simply adopt BTC's practices but discussed what was and wasn't working in their specific contexts—adapting methods, questioning assumptions, and sharing experiences of the gap between the framework's promises and their classroom realities. When Becca encountered the tension between BTC's promise that students in thinking classrooms would move through content quickly and her own experience of that promise remaining unrealized, she described it as "we haven't gotten there yet"—a formulation that held open the theoretical possibility of alignment while also naming an ongoing gap. She maintained the belief that teaching students to think through problem solving might eventually translate to test performance, even as she continued navigating the immediate tension between discovery-based learning and assessment preparation. What her relational context provided was not a structural critique of BTC's premises but something more proximate and perhaps more sustaining: an interpretive buffer that allowed her to experience the gap

between promise and reality as a feature of ongoing work rather than as evidence of personal failure. The resource's limitations did not destabilize her identity as a good teacher because she had colleagues who helped her hold that gap provisionally rather than absorb it personally.

This point carries a risk worth naming. If recognizing structural contradictions simply relieves teachers of self-blame—showing them that failure is inevitable and therefore not their fault—it could tip toward a resigned structuralism that undermines transformative commitment. The goal is neither structural fatalism nor individual self-blame, but closer to the hopefulness that Kelchtermans (2005) describes within inescapable conditions of vulnerability. In his words,

> The relationship of an ethical and thus vulnerable commitment opens up the chance that education (literally) "takes place". Such encounter makes the teacher feel that he or she is really ''making a difference as a person'' in the student's life. Joy, pride, existential personal fulfilment are the emotions that go with it. So vulnerability is not only a condition to be endured, but also to be acknowledged, cherished, and embraced." (p. 999).

Following the logic of such hopefulness, the structural conditions of vulnerability that makes teachers' decisions always contested and "emotionally non-indifferent" (p. 1005) are simultaneously the conditions by which their pedagogical judgements hold meaning. Yet, the findings articulated here demonstrate that the possibilities of embracing vulnerability do not simply happen naturally, they are related to the conditions of teachers' resource infrastructures, particularly their experience of relational resources.

What relational resources provided for Becca was not resolution of the tensions she navigated but the interpretive support to keep moving forward imperfectly, knowing that imperfection was not the same as failure. Carlos's case adds an important counterexample that sharpens this point. His colleagues were not uncritical consumers of BTC—they questioned its premises openly, articulating reasons why it would not work in their context. But their critique was not organized around structural analysis of competing purposes or honest engagement with what the framework could and could not account for. It was organized around assumptions about students' capacity—that their students were not capable of the kind of thinking BTC assumed, that trust in students' mathematical potential was naive given their histories with schooling. This was structural critique in form but deficit thinking in substance, and it produced not the interpretive buffer that Becca's community offered but its opposite: a social environment in which Carlos's commitment to trusting students as thinkers found no relational confirmation and his colleagues' resignation was collectively reinforced. What this suggests is that the productive embrace of uncertainty Kelchtermans (2005) describes is not simply a function of having colleagues who question resources—it depends on whether that questioning is oriented toward expanding what teachers and students can do together or toward foreclosing it. Relational infrastructure that confirms deficit assumptions is not a resource for navigation. It is another condition of demoralization that teachers must navigate around.

Race, Moral Perception, and the Unequal Distribution of Relational Support

The conditions shaping teachers' navigation of identity threats were not racially neutral. Racial positioning shaped what teachers experienced as threatening, what felt urgent and

noticeable, whose challenges carried weight, and what relational resources were available to help them hold uncertainty without being destabilized by it. Attending to race as a structural condition of navigation rather than as a modifier of universal experience reveals dimensions of teachers' work that the previous analysis cannot fully account for.

For Carlos, racial identification sharpened moral perception in ways that made certain responsibilities feel non-negotiable and certain contradictions structurally visible. His shared language, cultural references, and experience as a Hispanic immigrant positioned him as a role model in ways White teachers at his school couldn't replicate—and that positioning made the demographics of Finance Math versus Calculus legible to him as a pattern worth naming rather than a neutral institutional arrangement. His frustration with Finance Math students was not rooted in deficit assumptions about their capability but in his recognition that years of tracking and low expectations had taught them to wait to be taught—a recognition organized by his identification with students who shared his racial identity. Yet this sharpened moral perception came without the relational confirmation that would have made it sustainable. His colleagues' resistance to student-centered approaches was not simply pedagogical disagreement—it was organized around the same deficit assumptions about Hispanic students that Carlos understood himself as working against. The social environment that might have provided the interpretive buffer Becca's community offered instead reinforced the conditions he was trying to change. He responded by seeking support outside his school and eventually working to build the collegial infrastructure within it—but the labor of creating those conditions was his to bear in ways it was

not for teachers whose racial positioning did not put them in structural opposition to their colleagues' assumptions.

Becca's and Julie's whiteness created different conditions—not threats to competence but questions about authority and whether their progressive commitments actually served the students they taught. These questions are racially specific: they arise for White teachers working with students of Color in ways they do not for teachers whose racial positioning aligns with that of their students. Becca's "who am I to say?" was a question about whose definition of mathematical success should prevail—whether her commitment to sensemaking over test preparation reflected genuine responsiveness to students and families or an imposition of her own educational values on a community with different stakes in the system. Julie's racial uncertainty took a related but distinct form: whether creating multiple pathways for students perpetuated the sorting and labeling she claimed not to believe in, and whether her whiteness disqualified her from pushing back against a Black administrator's insistence on universal college preparation. Both questions are forms of identity threat—moments when teachers' sense of themselves as good and responsive was put in question by the racial dynamics of their contexts. But they were navigated differently. Becca had colleagues and community to help her work through questions about responsiveness without cycling into paralysis. Julie's isolation meant she absorbed those questions without the relational support to distinguish productive racial humility from self-defeating doubt.

Greta's case reveals what racial positioning looks like when context does not require its interrogation. Teaching predominantly White students in a private school where families had

already opted into progressive values, Greta did not face the pressures that made Becca and Julie confront their whiteness in relation to their pedagogical responsibilities within mathematics. Her progressive commitments were not in tension with her community's priorities, and no stakeholder challenged whether her vision served the students she taught. Race did not appear explicitly in her accounts of navigating pedagogical responsibilities, but this absence reflects the structural conditions of her context rather than the limits of her awareness. What a teacher does not need to name as relevant to their experience is itself shaped by privilege—and the unmarked nature of Greta's racial positioning was itself a racial condition, one that structured what she needed to navigate and what she did not.

What these cases reveal together is that racial positioning did not shape teachers' navigation as a fixed condition they carried—it was activated by the specific contexts that brought certain responsibility frameworks into competition and others into alignment. Becca's whiteness generated "who am I to say?" questioning because she was serving predominantly Black and Brown families with different stakes in the system she was working to challenge. Julie's racial uncertainty was activated by a Black administrator whose challenge she could not dismiss. Carlos's amplified responsibility emerged from his identification with students who shared his racial and linguistic identity and whom he saw as continuously marginalized. Had these teachers worked in different contexts—had Becca or Julie taught predominantly White students, or had Carlos worked with a population whose experiences didn't mirror his own—the same racial identities might have generated different tensions or no explicit racial questioning at all. Understanding race as a structural condition of navigation therefore requires attending not

just to who teachers are but to how their contexts make their racial positioning consequential—and for whom the terrain that produces makes sustainable navigation possible without additional labor.

Intersecting Conditions: The Terrain Teachers Experience

What these three conditions reveal together is something that examining each one in isolation cannot show: they do not operate independently but constitute each other in ways that produce the specific terrain each teacher navigated. Stakeholder challenges did not land uniformly; their weight depended on teachers' racial positioning and whose authority was privileged. Resources did not function uniformly; their capacity to provide interpretive support depending on the relational infrastructure available. For Becca, these conditions aligned in ways that made uncertainty manageable without requiring her to build the infrastructure that made it so. For Carlos, they misaligned in ways that required him to create that infrastructure himself while simultaneously navigating without it. For Julie, they combined to produce a context in which the interpretive work that might have named her dilemmas as structural had nowhere to take place. What these conditions reveal together is that sustainable navigation was not equally possible—not because some teachers were more capable or committed, but because the terrain itself was structured differently for each of them.

The Uneven Terrain of Navigation: Implications for Understanding Teacher Responsibility

The findings of this study do not resolve the tensions they examine—and the implications that follow should not be read as a roadmap for doing so. Teachers navigating genuinely

competing responsibilities cannot be supported by frameworks that promise resolution, by professional development that expands what good teaching requires without attending to what that expansion costs, or by resources that locate the problem of teaching in individual implementation rather than in the structural conditions that make certain responsibilities irresolvable. What this study asks of researchers, teacher educators, and those who design and lead professional learning is something more demanding and more honest: to take seriously the full humanity of teachers navigating impossible binds—their identities, their emotions, their provisional judgments made under genuine uncertainty—and to understand that supporting teachers means creating the conditions under which that navigation is sustainable rather than demoralizing. The sections that follow address what that requires across three dimensions: the identity stakes of navigating competing responsibilities, the emotional work that navigation demands and what institutions owe teachers in response, and the resource infrastructures that determine whether uncertainty becomes generative or demoralizing. A fourth implication addresses what the field of mathematics education research owes teachers—not just in how it supports practice but in how it represents the terrain it asks teachers to inhabit.

Reframing what teachers need

Recent scholarship on teacher learning has identified the problems of "good teacher" discourses that position teachers' identities along moral lines, creating conditions in which teachers experience their sense of self as perpetually under threat (Horn & Garner, 2022). Yet as this study confirms, those same identity investments are not simply liabilities—they are what make teaching meaningful. Teachers' narratives of moral goodness, as Chen and colleagues

(2021) show, are not merely coping strategies but the means by which teachers sustain their investment in work whose outcomes are never fully within their control. The question, then, is not how to free teachers from identity investment in their work but how to create conditions in which that investment does not become a source of demoralization when the work proves impossible to get entirely right.

Lampert's (1985) framework of dilemma management offers a vision for what those conditions might make possible. She describes the work of teaching not as resolving dilemmas but as making provisional choices that provide temporary respite while accepting conflict as endemic—and even useful—to the work itself. Kelchtermans (2005) extends this through the concept of vulnerability: not a feeling to be managed but a structural condition of teaching that, when embraced rather than endured, creates the possibility for pedagogy to be genuinely consequential. Together, these frameworks suggest that what teachers need is not more clarity about what good teaching looks like—not another framework for getting it right—but conditions that allow them to make provisional choices without those choices defining their worth. Identity threats, understood through this lens, are not evidence of inadequate commitment or insufficient knowledge. They are information about the structural conditions teachers are navigating, conditions that deserve institutional response rather than individual management.

The implication for those who support teachers is therefore this: professional development, mentorship, and collaborative structures need to be designed not around resolving teachers' uncertainty but around creating the conditions in which uncertainty is navigable. This means moving away from frameworks that promise resolution—that position the goal of teacher

learning as arriving at clearer, more coherent practice—and toward structures that honor provisional judgment, name competing purposes as genuinely irresolvable, and treat teachers' moral and emotional responses to impossible binds as legitimate professional knowledge rather than as problems to be overcome.

Emotions as professional knowledge

The findings of this study do not primarily reveal that teaching is emotionally demanding—that is already well established. What they reveal is more specific: that teachers' emotional responses to their work are forms of moral perception. The pride Becca felt in her student-centered approach, the grief Carlos experienced in Finance Math, the self-doubt that cycled through Julie's accounts of her practice—these were not reactions to teaching's difficulties. They were how these teachers knew what mattered, what was at stake, and whether the conditions of their work allowed them to honor their responsibilities. Emotions, in this sense, are not peripheral to teachers' sensemaking but constitutive of it—they are the medium through which structural conditions become legible or, when those conditions produce responses that have nowhere to go, illegible.

Kelchtermans (2005) establishes the theoretical foundation for this claim: vulnerability generates both demoralization and joy, and which direction it tips depends not on individual disposition but on the conditions of teachers' work. Santoro (2011) extends this by showing that demoralization is not emotional exhaustion but the erosion of moral rewards—the experience of being structurally prevented from doing good work as one understands it, producing an emotional signal that the conditions of work have failed rather than the teacher. Hochschild's

(1979) concepts of surface and deep acting—managing emotional expression while internal experience remains misaligned, versus genuinely shifting internal emotional states through reinterpretation—offer a framework for understanding what that signal costs teachers when it goes unaddressed; Horn and colleagues (2025) extend this by showing that the relational conditions of teachers' contexts determine which form of emotional labor is even possible. Critically, Chen and colleagues (2021) illustrate what is foreclosed when emotional responses are treated as problems to be regulated rather than as information to be interpreted: in their study, teachers' collective focus on preserving emotional equilibrium—by sustaining narratives of love and care that preserved their sense of moral goodness—foreclosed the harder work of interrogating the purposes their responsibilities were meant to serve, digging into the grief of their colleague rather than preserving emotional equilibrium. Managing emotion and making sense of structural conditions are not the same work, and institutional structures that conflate them leave teachers equipped to cope but not to understand.

The implication is not that institutions should invest more in teachers' emotional wellbeing in a generic sense—resilience programs, mindfulness training, or professional development focused on emotional regulation. These interventions, however well-intentioned, risk reproducing the individualizing logic this study has been examining locating the problem in teachers' capacity to manage their emotional responses rather than in the structural conditions producing those responses. What teachers need instead are professional structures that treat emotional responses as information deserving interpretation rather than as problems requiring management. This means creating space—in professional learning communities, in mentorship

relationships, in the design of collaborative structures—for teachers to ask what their emotional responses are telling them about the conditions they are navigating. Whether self-doubt signals personal inadequacy or structural impossibility, whether grief points to a situation requiring change or one requiring naming, whether pride reflects genuine moral alignment or a preservation narrative that forecloses deeper interrogation—these are questions that teachers cannot answer alone, and that institutional structures have a responsibility to help them ask.

Redesigning the conditions of resources

The conditions that allow teachers to interpret their emotional responses as structural rather than personal do not emerge spontaneously—they are built through the resources and relational infrastructures teachers have access to. Yet as this study shows, resources do not function as neutral supports whose value depends only on whether teachers engage with them seriously. They are organized around particular visions of what mathematics education is for, they carry built-in accounts of what the problem of teaching is and how to solve it, and they function differently depending on the social conditions of their use. The implication is not simply that teachers need more or better resources—it is that the field needs to attend more carefully to what resources make possible and what they foreclose, and under what conditions they support navigation rather than deepen self-doubt.

Horn and colleagues (2025) provide the most precise theoretical account of what makes resources generative: relational agency—the capacity to seek out colleagues' expertise, expand interpretations of problems, and co-construct responses—enables epistemic agency, the capacity to develop new understandings and adaptive stances rather than simply implementing prescribed

solutions. When resources are encountered within collaborative infrastructures that support relational agency, teachers can engage with them critically—questioning premises, distinguishing implementation challenges from structural impossibilities, and interpreting difficulty as a feature of genuinely competing purposes rather than as evidence of personal inadequacy. Without that infrastructure, resources risk functioning as Santoro (2011) warns: deepening demoralization by locating the problem in individual implementation rather than in the structural conditions that make certain responsibilities genuinely irresolvable. This dynamic is particularly consequential when resources are premised on a single uncontested account of what the problem of teaching is—frameworks that, as this study shows, fill the interpretive gap preemptively rather than leaving teachers room to ask whether difficulty might be structural rather than personal. The implication is not that such resources should be abandoned but that they should be presented and engaged with honestly: acknowledging what they cannot account for, naming the competing purposes they do not resolve, and creating conditions for teachers to interrogate their premises rather than absorbing their logic as the only available interpretation of failure.

The findings of this study suggest that the critical variable is not which resources teachers have access to but whether the conditions of their use support what Horn and colleagues (2025) describe as deep acting—the genuine reinterpretation of difficult situations that shifts teachers' internal experience rather than just their outward management of it. Becca's professional learning community did not give her a structural critique of BTC's premises, but it gave her something more proximate and perhaps more sustaining: an interpretive buffer that allowed her to hold the

gap between the resource's promises and her classroom reality as a feature of ongoing work rather than as evidence of failure. Carlos's experience reveals what is required when that infrastructure is absent—not just the difficulty of navigating without relational confirmation, but the labor of building the infrastructure itself, labor that fell to him precisely because the conditions of his context made it structurally unavailable. That labor is not a personal achievement to be celebrated in isolation. It is evidence of an institutional failure that should not be left to individual teachers to remedy.

The implication for professional development, school leadership, and teacher education is therefore this: investing in teachers' access to resources is necessary but insufficient. What matters equally—and what receives considerably less institutional attention—is whether teachers have collaborative structures that allow them to engage with those resources critically, to name what those resources cannot resolve, and to develop the shared interpretive frameworks that allow structural contradictions to be understood as conditions of the work rather than as personal failures. Building those structures is not teachers' responsibility alone. It is an institutional obligation—and one that the field has not yet taken seriously enough.

What mathematics education research owes teachers

The implications of this study extend beyond how teachers are supported to how the field of mathematics education presents the visions it asks teachers to enact. As established in Chapter Two, mathematics education research has generated a proliferating set of frameworks—each morally compelling, each backed by legitimate scholarly commitments—that make distinct and sometimes incompatible demands on teachers' practice, knowledge, and identity. The findings of

this study suggest that teachers who have absorbed these frameworks most deeply are not necessarily better equipped to navigate the tensions between them. In some cases, as Julie's experience illustrates, internalizing multiple competing commitments without relational support to name their incompatibility produces a particular form of suffering: a teacher who has absorbed the field's moral vocabulary deeply enough to hear herself violating it, without the field having equipped her with ways to interpret her struggles apart from blaming herself.

This is not simply a failure of individual researchers to attend to what teachers need. Researchers navigate their own structural conditions and competing responsibilities—pressures to advance paradigms, demonstrate impact, and produce work that gets taken up within a field organized around what is new and generative rather than what is uncertain and irresolvable. The incentive structures of academic research do not naturally reward structural honesty about the limits of what any single framework can accomplish, or the conditions teachers need to navigate competing frameworks with integrity. Producing visions of transformative mathematics education and attending seriously to what those visions cost teachers to carry are different kinds of scholarly work, and the field has developed stronger infrastructure for the former than the latter.

What this study asks of the field is therefore not that individual researchers do more but that mathematics education as a collective enterprise develop greater responsibility for the relationship between what it produces and what it asks teachers to carry. This might mean presenting visions of transformative practice alongside honest accounts of the structural tensions they create—naming what a framework cannot resolve rather than only what it promises. It

might mean attending to the conditions teachers need to engage critically with research-based frameworks rather than assuming that access to those frameworks is sufficient. And it might mean taking seriously, as a field-level question rather than an individual one, what relational and institutional infrastructure teachers need to navigate competing visions of mathematics education with integrity rather than demoralization. The same structural honesty this study asks teachers to extend toward themselves—accepting that imperfection is the condition of navigating genuinely competing responsibilities—the field might also extend toward its own work: acknowledging that no single vision resolves the terrain teachers inhabit, and that attending to that terrain is itself a form of scholarly responsibility.

This study also reflects a methodological commitment to that principle. The poems that open each teacher's case in this dissertation are not decorative—they are analytical and representational arguments about what research can and should do when its subject is the identity-laden, emotionally weighted, irreducibly uncertain work of teaching. Constructed from participants' own words through a process of poetic transcription and iterative interpretation, each poem distills rather than summarizes—foregrounding the emotional stakes, identity binds, and contradictions that conventional analytic writing tends to organize into neat findings. The process of writing them changed what I could see: distilling Becca's experience into poetic form compelled me to identify the tensions driving her sense of responsibility in ways that coding and analysis alone had not made visible. Poetry as inquiry produced different knowledge—not less rigorous but differently rigorous, attending to affect, metaphor, and recursive uncertainty in ways that narrative summary flattens.

This matters for the implication being made here. If mathematics education research asks teachers to live with irresolvable tensions—to hold competing visions simultaneously, to make provisional choices under genuine uncertainty, to navigate terrain that has no right answer—then research that represents that experience only through analysis and argument is already making a claim about what counts as legitimate knowledge. That claim is part of the structural condition this study has been examining: a field that produces compelling visions of transformative practice without always acknowledging the uncertainty those visions create, or modeling what it looks like to sit with that uncertainty rather than resolve it. Poetry is one way the field might expand what it considers legitimate scholarly representation—not to abandon analytical rigor but to ask what rigor looks like when the subject is uncertainty itself. If we are asking teachers to embrace vulnerability as a condition of their work, the field might also be willing to inhabit that vulnerability in its methods and representations—acknowledging not just what research has found but what it cannot yet resolve.

I close with an address to the teachers who made this study possible—and to the many teachers whose experiences it tries to honor without having had the privilege of hearing directly. The primary aim of this project was not scholarly impact but something more human: to see teachers in their full humanity—in their uncertainty and self-doubt, in their grief and their pride, in their provisional judgments and their stubborn commitments to students whose futures they care about more than any framework can capture. The teachers who shared their insecurities and doubts with me were doing something quietly radical: refusing to be seen through a single lens of

responsibility, insisting on the full complexity of what their work requires. I hope this study returns something to them—not answers, but recognition. Recognition that the terrain they navigate is genuinely impossible, that the weight they carry is not theirs alone to bear, and that continuing to move forward imperfectly, with integrity and care, is itself an act of profound moral courage.

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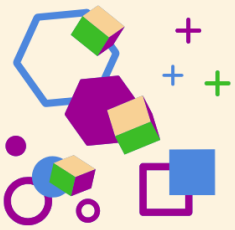
Appendices

A. Abbreviation key

BTC	Building Thinking Classrooms
IB	International Baccalaureate
DP	Diploma Program (program that results in IB diploma)
MYP	Middle Years Program (portion of the IB programming to prepare students between 8th and 10th grade)
PDM	Professional Development for Mathematics Teachers (pseudonym for Becca's professional learning organization)
PLC	Professional Learning Community

B. *Recruitment flyer*

Seeking Math Teachers!



Why do you teach the math you teach? What does it mean to teach math? What and who informs the purpose of your work?

If you are a middle school or high school mathematics teacher anywhere in the US and these questions intrigue you, I invite you to participate in this study!

What?

2-6 interviews as well as follow-up communication and observations (optional) aimed at understanding the purpose(s) of mathematics education that drive your work, your learning practices, and where/how you seek support.

Who am I?

My name is Amanda Coviello. I am a PhD candidate at University of Wisconsin-Madison in the Department of Curriculum & Instruction and a mathematics educator. This research is part of my dissertation project in which my goal is to begin to capture the complexity of teachers' learning practices beyond formal professional development spaces.

How?

Please fill out this brief survey (QR code right) to express interest or email acoviello@wisc.edu to discuss additional details

C. Interview #1 Protocol

In this study, I'm interested in the motivations and resources that mathematics teachers describe in relation to curricular and pedagogical decisions that they make that diverge from the norm in some way. For this interview, I will start by asking you some questions about your background and the school that you work in and then I will ask you more specific questions about some of your lessons and the resources and systems that support your teaching goals. While I have some questions, I hope that this interview will feel more like a conversation where you can share whatever feels most meaningful to you. It is also important to me that you feel comfortable during this interview. If at any time you do not feel comfortable answering a question or want to share context that I have not directly asked about, please feel free to reply to a question in whatever way honors your boundaries and humanity.

I believe it will take about one and a half hours to complete this interview and up to two hours depending on how much you would like to share. You may choose not to answer a question or to stop this interview at any time. I will be audio recording our conversation for data collection purposes and any information that you share will be anonymized before sharing publicly. I have sent a consent form for you to sign at this point indicating your permission to record this interview and use the information that you share. Please read this over and let me know if you have any questions. You may send the form back to me with your signature when you are ready.

Preliminary Interview Questions

0) Background & Mathematics Education

a. What grade or age of students do you teach?
b. How would you describe the school that you teach in terms of the students? Teachers? School culture?
c. How long have you been teaching mathematics? What mathematics do you teach? What made you choose to teach mathematics?
    - [*Alternatives for "generalist" teachers*]: How would you describe what you teach? What made you choose to teach ____? How does mathematics fit into the content that you teach?
d. How would you describe the content that you teach to a student? To a parent? To another teacher?

1) Vision

How do mathematics teachers navigate competing visions of mathematics education?

At this point in the interview, I am going to ask a series of questions aimed to better understand the educational philosophies that drive your work. There is no perfect answer to these questions, nor do I expect your beliefs to remain stagnant after this interview. It may be challenging to clearly articulate but please do the best you can, and I will provide prompting questions as needed.

a. Firstly, what do you believe is the purpose of mathematics education? In other words, why do students need to learn _____?
b. How would you describe what it is you most seek to achieve as a teacher? [follow up as necessary with clarifying questions about the mathematics that they teach]
    - Have these goals changed over time?
    - Have you ever wondered if these are the right goals for your students? How so?

    [Ask follow-up questions specific to the curriculum that they teach (e.g. Algebra, geometry, STEM, mathematics in context, etc.)]
c. What are the major ways you can tell whether you are doing the kind of job you want to do? What do you look for as an indication of your effectiveness?
d. Tell me about a classroom moment that you are particularly proud of. What makes it stand out to you?
    - How does this moment relate to the vision that you described earlier?
e. Are there moments or experiences that you can recall which were not aligned with your vision? What makes this moment stand out to you?
    - Are there any other tensions or challenges that have come up as you have attempted to enact your vision?
    - What compromises, if any, have you made in relation to this vision? How did these compromises emerge?
f. If you had the opportunity to bring about change in mathematics education (could be curriculum, instruction, structure of schooling, etc.), what single change would you most like to see?

2) Networks and Support

How do dominant structures and systems constrain teachers' imaginations?
How do teachers shape their support networks to inform their visions of mathematics education?

a. In what ways are your goals shared, or not, by your colleagues and school administration?
    - Do you find that the structure of your job and the people around you at school are supportive of ____?
b. How have your professional development or learning experiences been supportive (or unsupportive) of you meeting your goals?
c. Are there people or resources (within or outside of your school) that you would attribute to helping shape your goals and beliefs as a teacher? [Ask them to name some of the people/resources that they most often turn to and to describe details about how these resources have shaped their goals.]
    - How did you find this resource? What brought you to it/them originally?
    - How often do you engage with them on average? [*daily, weekly, monthly, etc.*]
    - What are some of the ways it is helpful?
d. Is this a resource you would recommend to another math teacher? Why? [ask questions to better understand why it's a meaningful resource to them]

g. Are there any other resources that you would like to be engaging with, but you aren't currently? What's preventing you?

Closing:

Thank you for your time today. Are there any questions that you have for me before we end?

Before we part ways, I would like to discuss more details about following up with you to make sure you are comfortable participating further or give you an opportunity to opt out or discuss any stipulations you may have.

For this project I am trying to capture as much detail as I can about the complexity and breadth of teachers processes of learning and development. To do that I am relying on being able to conduct multiple follow-up interviews and surveys with participants to get more clarity on the decisions you make, who and what you engage with, and your own perspectives on what learning you take with you. I would like to start by sending a survey with some additional questions about who or what resources you engage with and how often. This survey is on a google doc and meant to be filled out over time so that you can add information as it comes to you. I also would like to schedule a follow up interview before the end of the year to ask about your responses to the survey and some additional questions. Do you have any questions or concerns about participating in these follow-up activities?

D. Support Network Survey

The survey below—available for participants to respond via google docs—was ultimately discarded due to low responses

The questions below are intended to gain more insight into how you find guidance and support in meeting your intended goals as a mathematics teacher. Please take a couple of weeks to complete it over time. You may not think of all the resources important to you right away so I am sharing a google doc so that you can add connections and details as they come to you. Your answers to this survey will inform future interviews and be used to construct a diagram of your support networks that can be further analyzed for the project.

No actual names will be used in the analysis. Please feel free to use pseudonyms as desired but make sure you can identify individuals.

1. How would you describe what you hope for your students to get out of your math class? (Focus on top 3 goals)

2. Please list 5-15 resources and communities that you consider to be supportive to you in shaping/meeting these goals. Include a brief description (1-2 sentence summary) of why you included this resource. (These can be colleagues, friends, online/in-person communities, organizations, public figures, books, websites, podcasts, etc. – please be as specific as you can).

3. For each of the resources you named, indicate how frequently you interact with them. (Daily; weekly; monthly; 2-4 times per year; once a year; less than once a year).

4. Do you see yourself as a supportive resource to other teachers? Please list who they are in relation to you and how you offer support (10 max).

5. Please include any additional details that you feel are relevant to this study. This could be a place to include meaningful learning experiences that you've had recently, a reflection on a recent conversation you had with a colleague, or perhaps other resources that you were not sure fit the above criteria. Provide as much or as little detail as you would like. There is no wrong answer.

E. Example of Analysis

JULIE: interview #1 position 76

TRANSCRIPT	CODES & Memos (thematic)	Analytic Memos (experience)
Amanda 1. Have you ever wondered if what your goals are as a teacher, or even what your school's goals are for students are the right goals for them? **Julie** 2. Yes, I Yes, yeah. I mean, certainly wondering you I wonder that when, yeah, especially with students who struggle and like, what, every you know, the practical, like, what classes should they be required to take? for sure.	PEDAGOGICAL RESPONSIBILITY/ PURPOSE	Questions how to support students who are struggling with the math
3. **(cont.)** My early years of teaching math, I was teaching, I did some algebra one teaching, and did some pre calc teaching, but I also taught this class of it was Algebra One divided over two years, so it was 1a and 1b and I taught 1b to juniors and seniors. So to be in my class, they had to have failed at least some point along the way. So these were juniors and seniors who were still trying to finish algebra one. And it was for them, math was just this hated beast, you know. 4. So my definitely, my early in my early years, in those years, my goal. And it still remains this way my but my primary goal then was to help kids feel successful. 5. And it really wasn't to help that they would be able to necessarily use math in their future, but just that they would start to gain confidence and find that they could be successful and and, you know,	PEDAGOGICAL RESPONSIBILITY/ RELATIONAL/ STUDENT IDENTITY "PRIMARY GOAL"/STUDENT CONFIDENCE *[goals changing over time/in different contexts]*	**Narrative**: Relates back to early years of teaching math when she was teaching algebra 1 with students who hated math. She questions what the purpose of mathematics is when students are struggling so much and she wants to just help them feel successful. By focusing attention on critical thinking and problem-solving, she feels she can try to resolve this dilemma by considering the applications of mathematical thinking beyond the concrete

yeah, really gain confidence that, you know,		skills that students are learning.
6. **(cont.)** I think that goal broadened as I've been teaching longer to more like, what's the purpose of math?, but as I think about, yeah, I mean, you still, I still have those just really the basic questions about, What about the kids that just really struggle? And is there a purpose? 7. I mean, I want to say yes. I want to say that especially, maybe that's why I've moved to this other this like, Oh, here's the purpose of math is really about becoming a critical thinker.	PEDAGOGICAL RESPONSIBILITY/ PURPOSE/ CRITICAL THINKING UNCERTAINTY [*I think I'm understanding here that she is describing a value of math as teaching the habits of mind that children can then apply to other real-life problems that might not be solved using calculations or modeling but use the same skills of simplifying and manipulating problems to make them easier to solve*]	[*Lines 6 and 7 indicate some uncertainty as she hesitates to articulate what her goals are what purposes of mathematics should be driving her work.]*
8. **(cont.)** And I mean, one example that I use with the kids all the time is cleaning their room. And when, when you walk into your room, that's just a giant mess, and you look at it and it's overwhelming and you don't know where to start. And that's the way it can be when we see an equation that we're asked to solve or simplify. So we just start the same way, like, let's just start with something that we can see and that we can do. And so maybe just start by picking up all the laundry and just putting it into a pile, and sort of start sorting, sorting things in your room. And then, okay, now that we've sorted things and we've got piles of things, now we can start figuring out what to do with those things. And so sort of just breaking things down into small pieces and into into doable bites, and starting with the things that make sense with with easy things first. I think that's how we clean our rooms, and I think that's how we simplify equations.	PEDAGOGICAL RESPONSIBILITY/ PURPOSE/ CRITICAL THINKING "CLEANING ROOM" PEDAGOGICAL RESPONSIBILITY/ PURPOSE/APPLICATION	**Narrative:** Cleaning Room analogy metaphor for what her goals are for students. "Cleaning room" associates problem solving with breaking down an overwhelming task into smaller components.

9. So I hope that they can see, at the very least, you know, that kind of application, how can I approach a problem that feels so complex, even if it's even if it's just cleaning your room, 10. but and maybe that's deciding what college to go to, or deciding if I should go to college. So okay, so I don't know. I'm still like, Did I answer your question? Did I do I question your question was question when, yeah, really aligned with what the students need, yeah, I think I might have to think more about that one.		

F. Interview #3 Figma screenshot

The information below describes the information provided to participants for the 3rd interview and an example of how one participant (Carlos) arranged the given responsibilities. Teachers were first asked to rank each responsibility from highest to lowest based on the extent to which they felt "personally responsible" and then another axis was provided allowing them to move each responsibility left or right depending on whether the given responsibility felt like it was more internally valued or externally valued.

i. List of responsibilities to be organized during interview (emailed in advance):

- Make sure students have the content knowledge necessary to be prepared for future math courses
- Instill a sense of confidence in students' self-efficacy in relation to their mathematical capabilities
- Provide instruction that gives students the tools and knowledge they need to pass external assessments
- Cover all content standards as mandated by the district or school curriculum
- Ensure that your class is a place where students feel that their cultural experiences, racial and gender identities, and personalities are celebrated and represented
- Teach students in ways that honor the values and wishes of their families and communities
- Utilize advanced technological and educational tools that allow your students access to modern ways of teaching and learning
- Ensure all students, regardless of physical or mental ability, have the resources and support they need to learn mathematics
- Instill an appreciation for mathematical patterns and abstraction that are integral to the practice of mathematics
- Give students problems that are applicable to their lives and that advance their career opportunities
- Come up with activities and problems that promote high levels of student engagement
- Teach ways of thinking and problem-solving that shape students' ability to critically engage with the world around them
- Prepare students to contribute to technological and scientific progress in STEM fields
- Challenge dominant narratives about what makes someone a "math person"
- Develop students' habits in logical reasoning and critical thinking
- Create a classroom environment where all students feel a sense of belonging and community
- Address and interrogate racial and gender biases in mathematics
- Facilitate discussions that prompt students to share their reasoning and ask questions
- Make sure that students feel trust from their teacher in their mathematical abilities

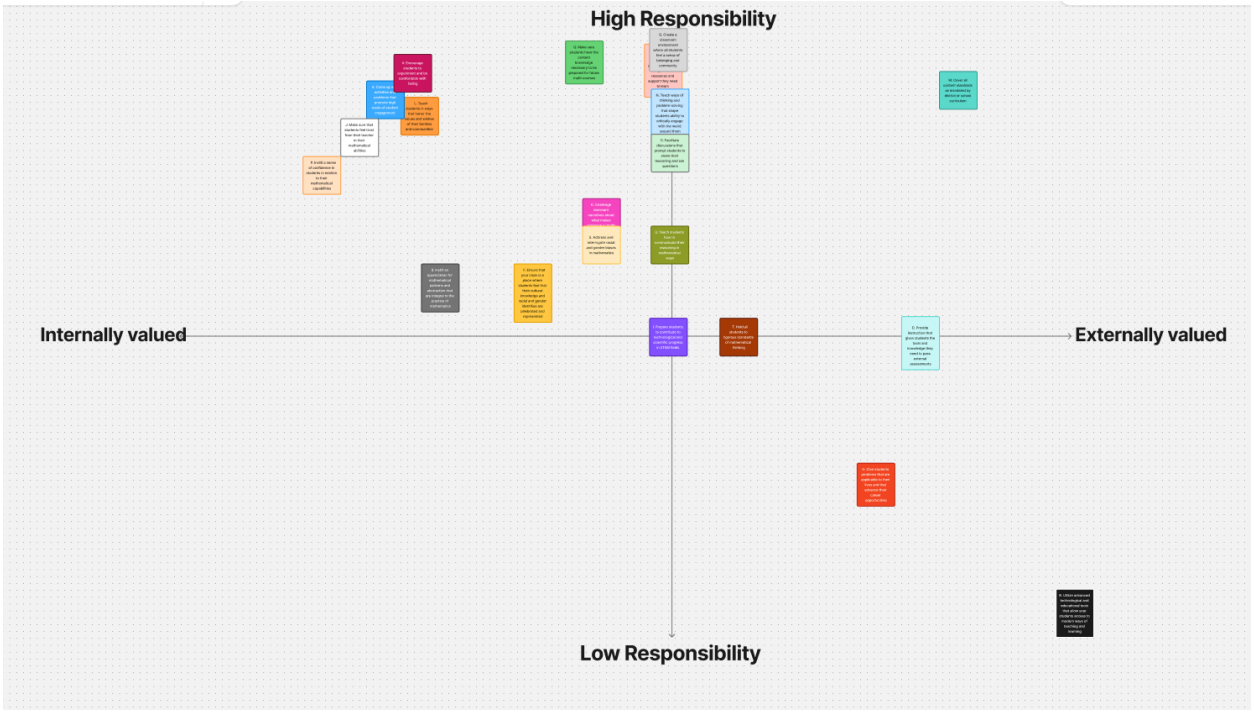
ii. List presented to teachers on Figma for them to drag and place on axes with 3 additions based on other interviews:

T. hold all students to rigorous standards of mathematical thinking

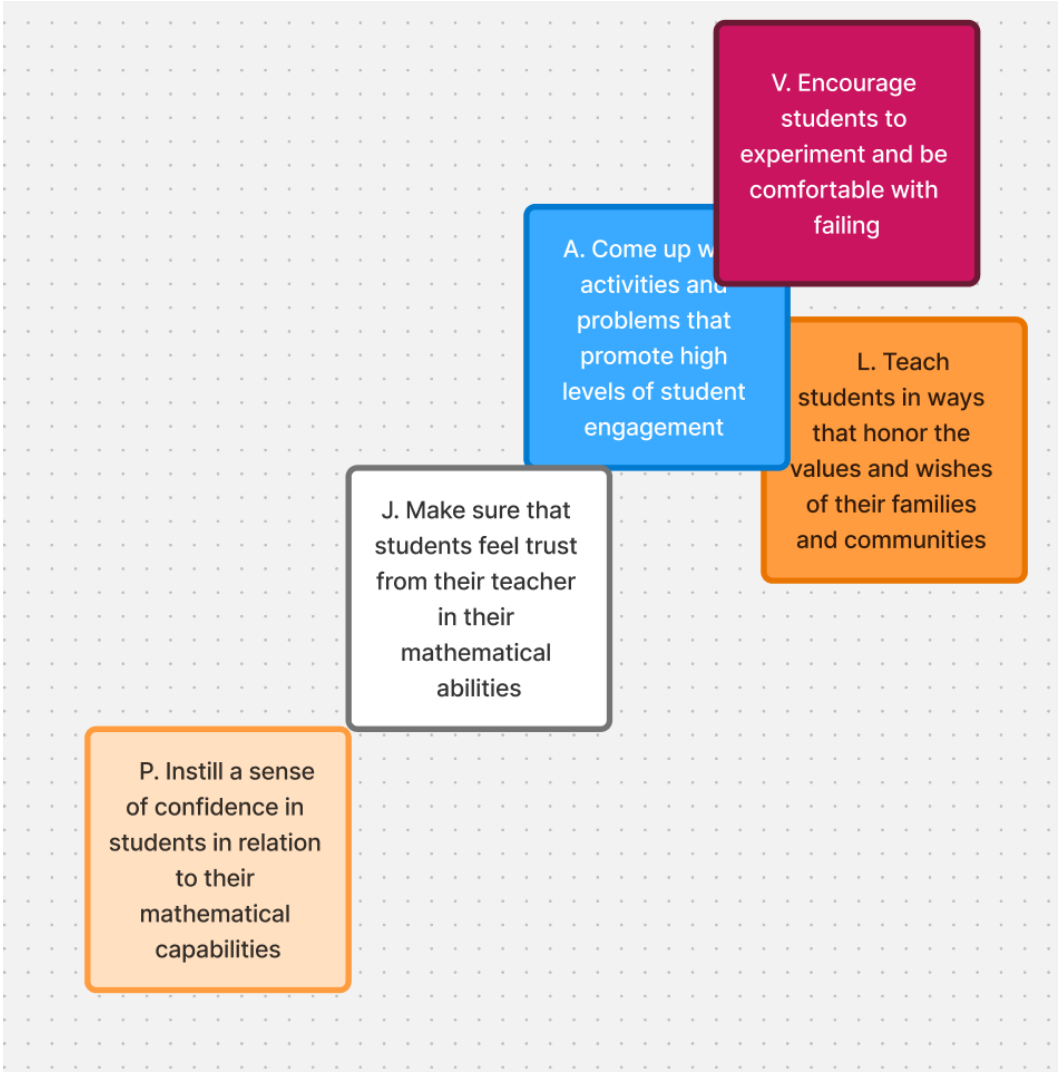
U. Teach students how to communicate their reasoning in mathematical ways

V. Encourage students to experiment and be comfortable with failing

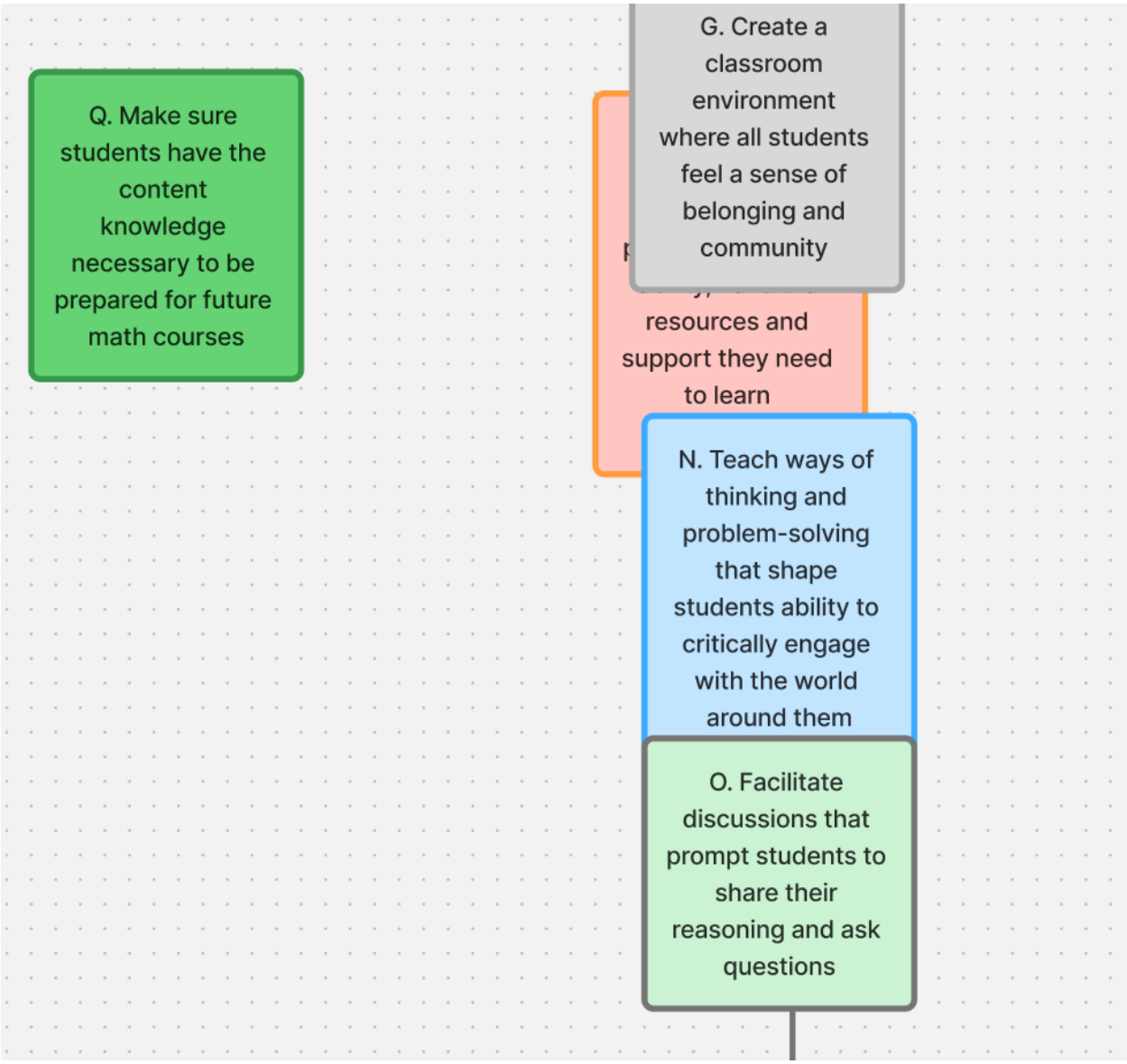
ii. Carlos' final diagram. (zoomed in screenshots below)



High responsibility/internally valued



High responsibility/neutral (both internally & externally valued)



G. On the use of Generative AI

1. A scattered brain

A scholar synthesizes
Revises
Thinks and thinks and thinks
the end is so close
I'm crying again
Can I make it?

Just one more sentence, paragraph, page, chapter
Only for edits
Clarifying my thinking
Right? I am? Right?
Will you tell me, *Claude*?
Cheater!
How many bottles of water is that now?
You're doing it "*ethically*"

It's a resource.
It uses resources.
My thoughts, *my* ideas, *my* care
Water, energy, people
It's me!
Mostly

the end is so close.

2. The Academic

During production of this work, I utilized [**CLAUDE.AI**], in order to help with the creation of this [**DISSERTATION**]. Generative artificial intelligence was used to [**BRAINSTORM, CREATE OUTLINES, REVISE WRITING, ADD DETAILS, AND GENERATE TRANSITIONS**]. The author reviewed the created content produced by this generative AI Tool and assert the content within this document is factually accurate and free of plagiarism. The author takes full responsibility for the submitted document.
(From Spencer.org, "Policy on the use of generative AI")

3. An honest accounting

While I maintain ownership over my research design, analysis, and findings that are articulated in this project, I want to be transparent about the extent to which Claude played a role in the process of translating my work into prose that went beyond mere grammatical editing assistance. The role that Claude took in the writing process was akin to a conversation with a knowledgeable colleague or advisor who would offer prompting questions as directed, make suggestions for articulating complex ideas clearly, or suggest potential chapter organization to structure an argument. In early stages, I shared what chapter I was working on, what topics this chapter would explore, and asked Claude to suggest a detailed outline for the chapter and questions my writing should respond to. For example, my initial prompt from late October 2025 was:

I'm writing a dissertation and currently working on a theoretical framework and literature review chapter (one chapter combined) that discusses how my work is situated within theories of teacher learning and teachers' sense of pedagogical responsibility. Scholars whose work I want to include are Nicole Louie, Ilana Horn, Thomas Philip, and Rochelle Gutierrez. I can share a detailed abstract with you and I am hoping you can use that abstract and the work of these scholars to help me come up with an outline for this chapter that I can build off of.

In the ensuing conversation, I shared a draft of my abstract, theoretical writing I had previously done from my proposal, and more details on how I intended to include the work of the aforementioned scholars along with additional scholarly work. Claude produced a possible outline. As I tried to work with that outline, I noticed ways that the outline diverged from what I

had intended to communicate or simply did not make sense. I returned to Claude and clarified my argument and where the AI outline diverged. Claude offered a revised outline. In this way, I worked iteratively with Claude. The resulting outline served as a foundation for generating drafts of writing and revisiting literature to elaborate on the ways in which I conceptualized the role of the theory within my dissertation. However, in many cases, I did not use what Claude provided in a direct way; rather, one way Claude was helpful was in producing ideas that I did not agree with, but which helped clarify what I *was* trying to say.

Additionally, I asked Claude to suggest more literature I could consult, and I did take up many of those suggestions. I also requested Claude's assistance in creating a weekly reading and writing schedule. This schedule helped me maintain a structured focus on the goals I had set for the upcoming months.

At other points I used Claude as a brainstorming tool. Within the same conversation described above, I asked Claude to offer suggestions for questions and concepts I might have overlooked. I provided explicit direction for Claude to read and respond to my work as a critical advisor rather than an enthusiastic supporter of my thinking. My intention was to use Claude in a way that was pushing and challenging my own thinking by offering different perspectives that I had not adequately addressed or pointing out areas that required clarification.

During later stages of writing, I used Claude to turn my in-process arguments and drafts of writing into more clear and concise prose that would reduce my personal tendency to use run-on sentences and repetitive language. Through numerous conversations and iterations, the structure and content of my writing underwent significant transformations from Claude's initial

ideas. This change reflected my active engagement in the process, allowing me to better describe the data and theoretical perspectives that Claude may not have fully grasped. My use of Claude became instrumental to my writing process which was otherwise isolating to the point that I often felt stagnant without a thought-partner to help me think through what I was noticing in the data, how it connected to the literature, and how to articulate the larger points that I wanted to make about teachers' humanity, sensemaking, and sense of responsibility. Yet I also struggled with the ethical implications of using Claude in this way.

This project does not purely stand as an academic contribution to a field of research but is, even more so, an evaluation of my intellectual capacity for conducting and representing research. I questioned whether my use of AI was its own proof that I had failed to meet the standard of intellect expected of a PhD degree. In this way, I faced my own responsibility dilemma; could I simultaneously meet my responsibility to demonstrate my intellectual capacity through rigorous and independent writing alongside my responsibility to my own mental health that was increasingly negatively affected by the process of writing in isolation? While others may respond differently to this dilemma, I responded by creating my own boundaries around my use of Claude that would allow me to take the intellectual work of this project seriously without depleting my emotional resources.

These boundaries included always checking Claude's writing suggestions against my own knowledge of the literature and of my data. I did not use sources that I was not familiar with myself and often challenged the assumptions that Claude made about what my data was saying or how it connected to the literature. I also made sure that I was taking time to think through my

writing and generate rough drafts that could be used as a starting point for revisions so that I was not purely relying on Claude to generate arguments that I had not made myself. My conversations with Claude often involved lengthy back-and-forth exchanges that allowed me to gain a deeper understanding of my argument through dialogue. This process helped me to overcome blank-page syndrome and produce writing that was a more in-depth representation of my findings than I might have been able to articulate myself with the time I had. As such, I stand by my intellectual work in generating this dissertation despite my use of an understandably controversial tool.

I also want to name here my genuine discomfort with having contributed, through my use, to the environmental and economic harms caused by AI companies—the energy consumption, the water use, the labor conditions, and the capitalistic pursuits of technology companies that I do not want to normalize. These concerns matter more to me than this dissertation. I used this tool anyway, under conditions that made completing this work without it feel genuinely impossible, and I carry the weight of that choice. I do not offer this as absolution but as an honest account of an imperfect decision.