



Understanding equity in multilingual math classrooms: teacher positioning for emergent bilinguals

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Abstract

This study investigates how six U.S. high school mathematics teachers position themselves and their emergent bilingual students (EBs) within the classroom. Specifically, it examines how translanguaging pedagogy promotes equity for EBs in mathematics learning environments. Findings indicate that teachers generally adopted inclusive and affirming storylines more frequently than exclusionary or deficit-based ones, though results varied across participants. Notably, teacher self-positioning was found to be inherently reciprocal to how the teachers position their EBs, often resulting in a dynamic distribution of power. During a year of professional development in which teachers used research-based tools and translanguaging strategies, this study demonstrates that translanguaging provides a powerful framework for challenging deficit narratives that marginalize EBs. The results suggest that teachers' positioning with translanguaging storylines can foster more humanizing, rigorous, and linguistically inclusive mathematics classrooms.

Keywords Translanguaging · Positioning theory · Emergent bilinguals · Equity · Mathematics teachers

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Introduction

Equity in education for emergent bilingual and multilingual students is a complex, multidimensional issue, particularly in mathematics classrooms where linguistic and mathematical demands intersect (I, 2019). We use the term emergent bilinguals (EBs) to refer to students developing proficiency in the language of instruction while maintaining and utilizing their home language(s), following García and Kleifgen (2018). According to them, framing bilingualism as an asset rather than a deficit underscores the need for equitable education that supports mathematical learning and language development in students' home languages and the language of instruction.

In mathematics education, equity is a multifaceted concept that prioritizes fairness over sameness (Gutiérrez, 2002, 2012). This approach emphasizes a “fair distribution of opportunities to learn” (Esmonde, 2011, p. 52), ensuring that achievement is not predicted by students' race, gender, or language. This fairness rejects monolingual standardization, which mistakenly equates identical English-only instruction with equal opportunity. Instead, equity necessitates addressing historical injustices by providing resources tailored to diverse needs. By ensuring both access to rigorous content and meaningful participation in classroom practices, equity enables all students to reach their potential and develop positive mathematical identities (OECD, 2023).

Hence, achieving equity for EBs requires moving beyond an English-only or dominant-language-only approach and embracing multilingualism as a resource to maximize their learning opportunities (UNICEF et al., 2024). Research has long advocated for bilingual/multilingual education to enhance EBs' academic success (Erath et al., 2021; Lopez et al., 2017), emphasizing the importance of providing equitable learning opportunities and access to cognitively demanding mathematics instruction (I, 2019; Moschkovich, 2012), while centering students' cultural assets (Gutiérrez, 2012). To operationalize these goals, this study utilizes two core constructs: translanguaging and positioning. In this study, translanguaging refers to the pedagogical practice of allowing students to leverage their full linguistic repertoires as a cognitive resource for sense-making (García et al., 2017). Positioning involves the discursive process by which individuals are situated, or situate themselves, within social interactions, thereby shaping their perceived competence and authority (Davies & Harré, 1990). Although access to learning opportunities has been central to equity-related studies in mathematics education, Gutiérrez (2012) contended that the critical dimensions of identity and power remain less discussed. By examining the intersection of translanguaging and positioning, this research seeks to address these gaps.

We investigated how U.S. high school mathematics teachers position EBs and how their instructional choices reflect the equitable or inequitable treatment of students' linguistic resources while participating in a professional development (PD) program. Grounded in positioning theory and translanguaging pedagogy, we developed a framework for this qualitative study to examine the relational dynamics of positioning and understand how teachers' discourse and decision-making construct either asset- or deficit-based views regarding EBs' access to rigorous, culturally rich mathematics. Rather than evaluating a specific intervention, our study highlights translanguaging as a transformative device that can disrupt traditional classroom hierarchies and advance equity (Fu et al., 2019). We address a key empirical gap

by demonstrating how pedagogical practices that affirm bilingualism can dismantle deficit-based positioning, an intersection seldom examined in empirical research. To explore these dynamics, this study is guided by two central research questions: “How do U.S. high school mathematics teachers position themselves and EBs?” and “How does the integration of translanguaging pedagogy disrupt teachers’ deficit-based views and foster asset-based perspectives toward EBs?”

Theoretical backgrounds

Translanguaging as a theory of bilingual performance and a pedagogy for equity

Translanguaging is both a theory of bilingual performance, viewing language as a single integrated system rather than separate compartments (García, 2017; Li, 2018), and a transformative pedagogy for equity (King et al., 2023; Yilmaz, 2021). This strand provides the foundational critique of deficit models that frame EBs by a perceived linguistic lack (Gutiérrez & Orellana, 2006) or limited English proficiency (Callahan & Gándara, 2004). Such marginalization is often reinforced by a “culture of exclusion” (Louie, 2017), where monolingual norms bar EBs from meaningful participation (Wagner et al., 2012). To dismantle these hierarchies, research emphasizes the intentional use of students’ full linguistic repertoires (García et al., 2017), such as encouraging EBs to use their home languages alongside the language of instruction to deepen understanding and engage in rigorous content. This pedagogical move is operationalized through three elements: Stance, Design, and Shifts. We utilize these elements to inform the design of our PD, rather than as an analytic lens for classroom discourse.

The stance involves a fundamental belief that all students are capable contributors, rejecting deficit models in favor of viewing fluid language use as a tool for sense-making (García, 2017; Gutiérrez & Orellana, 2006). As a political act, it disrupts standardized approaches that marginalize EBs, resisting linguistic imperialism by elevating non-dominant languages in classroom discourse (García, 2017; Yilmaz, 2021). This stance is supported by international research in Hong Kong, where Tai (2022) argues that a teacher’s underlying inclusive philosophy is a vital prerequisite for equitable mathematics learning in English-medium settings. By valuing heritage languages, teachers create empowering spaces where mathematics is positioned as a culturally inclusive practice (Creese & Blackledge, 2015; Gutiérrez, 2012; Willging & Oliveira, 2023).

Complementing this stance, design refers to the planned environment, transforming Stance into tangible supports such as translation slides, bilingual tasks, and home-language grouping (Yi et al., 2024; King et al., 2023). Our PD design was informed by studies in New Zealand and Australasia, which demonstrate how creating humanizing assessment designs and translingual materials, such as those used in Māori and Samoan contexts, can challenge monolingual dominance and center students’ cultural values (Crosby, 2023; Seals et al., 2020). Rather than simplifying tasks, teachers should leverage EBs’ linguistic and cultural knowledge as high-level intellectual

resources (I, 2019; Yi et al., 2024), countering deficit views that focus solely on English proficiency (MacSwan, 2017; Yilmaz, 2021).

Finally, shifts represent real-time moves in which teachers dynamically respond to student thinking (Vale et al., 2016). To disrupt the silencing effects of traditional English-only norms, research emphasizes active teacher facilitation through scaffolding moves like revoicing with Spanish cognates, utilizing translation tools, and encouraging native-language written reflections (Willing & Oliveira, 2023). Enacting these shifts requires multidimensionally noticing student gestures and translanguaging as mathematically relevant contributions (van Es et al., 2022). By explicitly inviting language switches, revoicing student ideas, and assigning competence to elevate student status, teachers effectively dismantle deficit perspectives (García et al., 2017; Louie, 2017). International scholarship underscores the necessity of these shifts. For instance, teachers in Zimbabwe frequently employ spontaneous translanguaging shifts to navigate standardized mathematics curricula, demonstrating that moving between languages is a vital cognitive tool (Nhongo & Tshotsho, 2019). Similarly, global research, including the study in Luxembourg (Gómez Fernández, 2019), indicates that normalizing multilingual talk fosters equitable group collaboration by directly addressing the intersections of language and power. Ultimately, these moment-to-moment instructional decisions are critical because they coalesce into the broader equity storylines explored in this study (Willing & Oliveira, 2023).

Positioning, equity, and emergent bilinguals in mathematics

Extensive research in mathematics education has established that classroom discourse is never a neutral exchange of information; rather, it is a site where identity and power are constantly negotiated through social interaction (Yi et al., 2025; Drageset & Ell, 2024). To investigate these dynamics, this study utilizes positioning theory, which examines how fluid, moment-to-moment conversational roles shape student relationships and identities within the learning environment (Yi et al., 2025; Davies & Harré, 1999). Scholars have argued that positioning enables an analysis of how classroom discourse patterns can either empower or marginalize students, directly influencing their access to mathematical ideas through the roles they adopt or resist (Drageset & Ell, 2024).

In mathematics classrooms, these interactions are vital for EBs, as equitable access to discourse is foundational to their participation and learning (Wagner et al., 2012). When EBs are structurally constrained to simplified tasks or restricted to the dominant language of instruction, they are often perceived as less capable and excluded from rich peer discourse—restrictions that severely impede their learning trajectories and shape their evolving identities as mathematics learners (Drageset & Ell, 2024). The diverse identities students bring into the classroom can, in turn, affect their inclination to engage or adopt specific positions within the learning environment (Darragh, 2016). Consequently, students' instructional experiences directly dictate their development of a mathematics learner identity (Langer-Osuna & Nasir, 2016). For EBs, when language barriers are treated as cognitive limitations, students are routinely positioned as passive or slow (Pinnow & Chval, 2015). Conversely, when teachers implement inclusive discourse, they play a pivotal role in ensuring

that all students are positioned as capable mathematical sense-makers regardless of linguistic background (Yi et al., 2025; Smith, 2022).

Translanguaging storyline framework

To examine the critical dimensions of equity for EBs in mathematics education, we developed the Translanguaging Storyline Framework. This framework is grounded in Gutiérrez's (2012) Critical Axis of Equity and developed with Positioning Theory (Davies & Harré, 1999) as the analytic lens and Translanguaging as the pedagogical lens.

The dimensions of equity

We ground our work in the Critical axis of equity that includes the dimensions of Identity and Power (Gutiérrez, 2012). The Critical axis centers on how language and culture shape a student's sense of belonging. Identity involves balancing cultural resources with academic participation, so students can find mathematics meaningful, while Power involves elevating student voice and rethinking who is recognized as mathematically competent (Gutiérrez, 2012). In this study, affirming identities through translanguaging is theorized as the primary power mechanism for fostering inclusion.

Positioning theory as the analytic engine

To operationalize these dimensions, we use Positioning Theory to analyze how teacher discourse fluidly shapes EBs' roles. We employ three interrelated constructs:

- **Speech/Communication/Positioning/Social Act:** The concrete instances of verbal or non-verbal actions that unfold during social interactions (Tait-McCutcheon & Loveridge, 2016). These acts, encompassing who speaks, what is conveyed, and how it is expressed, are instrumental in assigning positions and enacting broader storylines (Drageset & Ell, 2024). In this study, we analyze teacher discourse and practice to identify specific acts that either invite or suppress multilingual sense-making.
- **Position:** The clusters of rights and duties associated with these acts (Harré & Moghaddam, 2003). These positions are dynamic, context-dependent, and actively shifted with individuals often occupying multiple roles simultaneously (Tait-McCutcheon & Loveridge, 2016). For example, a specific act can position EBs as either "active learners" or "passive learners."
- **Storyline:** The overarching narratives co-constructed through repeated acts and their associated positions (Davies & Harré, 1999; Yi et al., 2025). While acts and positions occur in the moment, storylines provide the longitudinal coherence that defines a student's classroom experience (Davies & Harré, 1999).

These three core constructs of positioning theory are dynamic and interrelated (Yi et al., 2025). While acts and positions allow for a micro-level analysis of discourse, we focus on the storyline to address the relative scarcity of research on this construct (Herbel-Eisenmann et al., 2015). In our framework, storylines provide the longitudinal coherence necessary to interpret how daily discursive acts coalesce into broader narratives of equity or marginalization. For EBs, classroom interaction is vital, as the resulting storylines determine their access to mathematical participation and the development of their identities as capable learners (Wagner et al., 2012).

Synthesizing the Constructs: Translanguaging Storylines

Both translanguaging and positioning theory provide robust lenses for elucidating the complex equity challenges faced by EBs. Grounded in our literature review, we developed a cohesive framework featuring two contrasting storylines that characterize EBs' mathematical experiences: Exclusionary/Deficit Storylines rooted in a monolingual stance, and Inclusive/Affirming Storylines reflecting a translanguaging stance (See Table 1).

We utilize positioning theory within this framework to elucidate how translanguaging can dismantle deficit storylines regarding EBs' capabilities. Because teachers' practices shape how diverse students participate (Yi et al., 2025; Drageset & Ell, 2024; Moschkovich, 2012), they play a pivotal role in ensuring inclusive discourse. By integrating translanguaging, teachers reposition EBs as capable learners and redistribute power, fostering environments where linguistic diversity is an intellectual asset and all students feel empowered. Under this framework, equity is conceptualized as the product of intentional, asset-based storylines built through these daily, localized positioning practices that validate EBs' intellectual contributions. Translanguaging operates as the primary pedagogical vehicle for this shift, enabling students to leverage their full semiotic repertoires to communicate complex mathematical thinking. Together, these intersecting constructs map out how linguistic flexibility and discursive actions work in tandem to dismantle deficit perspectives and enact equitable mathematics instruction. As illustrated in Fig. 1, our framework maps out a fully reciprocal ecosystem; a teacher's underlying stance (monolingual vs. translanguaging) functions as a structural gateway that shapes and constrains classroom discourse. This model highlights a bidirectional relationship: a teacher's reflexive positioning moves continuously open up or restrict the interactive positions available to EBs, and these micro-level interactions simultaneously reinforce, and are reinforced by, the macro-level storylines.

Methods

This section outlines key components of the research design, including author positionality, participant information, the context, and the data collection and analysis methods.

Table 1 Translanguaging storyline framework for EBs in mathematics classrooms

	Exclusionary/Deficit Storylines (Monolingual Stance)	Inclusive/Affirming Storylines (Translanguaging Stance)
Overall Description	Traditional education enforces monoglossic views and language separation, sustaining deficit perspectives of EBs and marginalizing their linguistic, social, and cultural capital (Hunter, 2022).	Translanguaging challenges deficit views in monolingual settings by promoting bilingualism as a resource, creating new narratives that portray EBs as competent and capable (Yilmaz, 2021).
Positions of Teachers (Reflexive Positioning)	The teacher is positioned as the sole knowledge provider and decision maker in the classroom. The teacher holds concentrated power over classroom interactions. The teacher's language and culture dominate the classroom or are expected to remain neutral, making it difficult to support diverse students, especially when teachers are under-resourced (Boaler & Greeno, 2000).	The teacher is positioned as a facilitator of learning, co-building on students' ideas and enabling reflection and communication. The teacher is positioned as a supporter who creates a safe space where EBs can persevere with challenging mathematics, sharing power and fostering student agency (Gómez Fernández, 2019). The teacher is positioned as culturally and linguistically responsive by creating linguistically sensitive environments and by celebrating bilingualism (Robertson & Graven, 2019).
Positions of Students (Interactive Positioning)	Position EBs as passive or slow learners by viewing language barriers as limiting their participation (Louie, 2017). Position EBs as marginalized by framing mathematics as inherently difficult, exclusive, or rooted solely in Western traditions. Position EBs as low performers by viewing their bilingualism on the periphery instead of integrating it into whole-class instruction. Position EBs' languages as separate, which hinders bilingual development.	Position EBs as active mathematical thinkers who draw on their full linguistic repertoires to engage meaningfully in learning (Robertson & Graven, 2019). Position EBs as intellectual contributors whose cultural knowledge and multilingualism broaden mathematics understanding and strengthen their bilingual math identities (Yilmaz, 2021). Position EBs as capable math doers by seeing their bilingualism as a central resource that enriches whole-class instruction (Yilmaz, 2021). Position EBs' languages as a unified system that supports bilingual development, enables multilingual math assessment, and affirms their identities (Crosby, 2023).

Positionality

The first author, a mathematics education researcher, former U.S. teacher, and immigrant woman, served as a co-planner and co-teacher within this professional development partnership. As a multilingual, non-native English speaker, she brings particular sensitivity to the role of students' linguistic repertoires in mathematical sense-making. The second author is a monolingual English-speaking white woman and a former high school mathematics teacher of EBs who participated in data collection and led co-reflection sessions. The third author is a multilingual Nepali woman whose entire educational trajectory took place within translanguaging environments. Her lived experiences as an EB inform her view of translanguaging as a vital tool for content access and identity formation; she also supported data collection and co-reflection leadership. Collectively, the authors' diverse linguistic and intersectional backgrounds, spanning monolingualism, immigrant status, and varied translanguaging trajectories, critically shape their shared interpretive lens regarding classroom power dynamics, language validation, and equity.

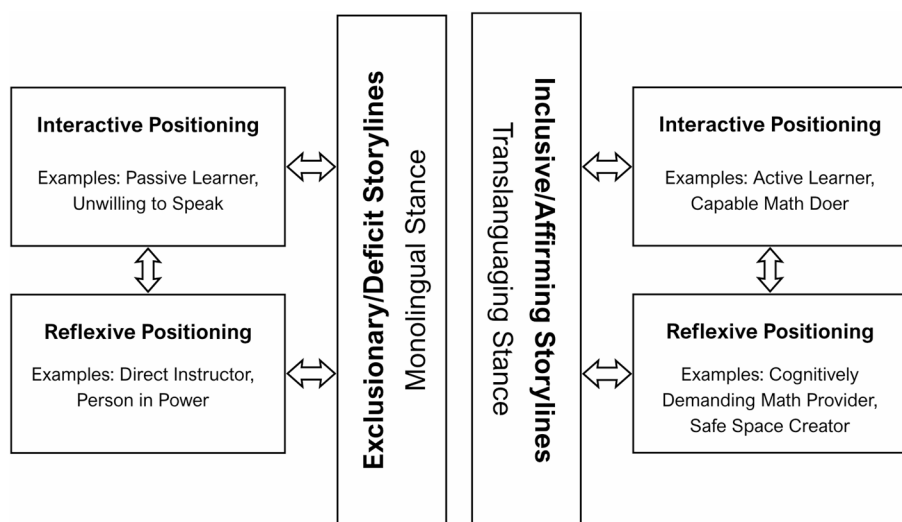


Fig. 1 The translanguaging storylines framework: mapping the reciprocal relations

Participants and context

This study was conducted over two academic years within a linguistically diverse Midwestern urban district, where EBs comprise over 20% of the student body. Participants included six high school mathematics teachers (Table 2), each teaching an EB-only Algebra or Pre-Algebra course. These sheltered classrooms serve as transitional spaces for students with beginning-level English proficiency, providing specialized support without sacrificing academic rigor. They use the same curriculum and assessments as general education sections to ensure high expectations (Fritzen, 2011; Markos & Himmel, 2016).

Each teacher followed a consistent protocol: a pre-interview, an independently taught pre-lesson with reflection, seven cycles of Collaborative Situated Professional Development (CSPD; Yi et al., 2024), a post-lesson with reflection, and a post-interview. The CSPD cycles were grounded in the Stance, Design, and Shifts framework (García et al., 2017) and followed a three-phase structure of co-planning, co-teaching, and co-reflection. During co-planning, researchers and teachers collaborated through an asset-based stance, viewing bilingualism as a fundamental mathematical resource to counteract deficit storylines. This stance informed the design of challenging tasks and routines, such as encouraging the use of preferred languages when reading problem slides aloud, collective notetaking, and mathematics journals (Yi et al., 2024), Notice & Wonder (Ray-Riek, 2013), and Think-Pair-Share in same-language groups (Kaddoura, 2013). In the co-teaching phase, the first author and teacher jointly led lessons, with the researcher initially modeling asset-based teaching before gradually moving responsibility to the teacher. This phase emphasized pedagogical shifts (real-time moves that followed students' linguistic lead and encouraged student-led mathematical modeling), such as delaying teacher help to encourage productive struggle and drawing on students' diverse funds of knowledge (Kiramba, 2017). Finally, co-

Table 2 Contextual information of teacher participants

		Teaching experience	Linguistic identity	Language spoken in the classroom
Algebra 1	Harper	25+ years 7–8 years with EB-only courses	Monolingual in English	Spanish, Swahili, Burmese, Karen, Karenni, Kunama, French
	Norris	3 years 1 year with EB-only courses	Bilingual in English and Bengali	Spanish, Swahili, Arabic, Karen, Kunama, Vietnamese, French
	Richardson	23 years 6 years with EB-only courses	Monolingual in English	Spanish, Swahili, Pashto, Arabic, Somali
	Ellis	5 years 2 years with EB-only courses	Bilingual in English and Spanish	Spanish, Persian, Swahili, Arabic
	Horton	9 years 9 years with EB-only courses	Monolingual in English	Spanish, Swahili, Karen, Kunama, Sundanese, Indonesian, Pashto
	Rodriguez	3 years 1 year with EB-only course	Bilingual in Spanish and English	Spanish, Arabic, French, Swahili, Persian, Tigrinya, Pashto

reflection sessions allowed the team to review EB participation, assess the effectiveness of linguistic strategies, and set new goals for subsequent cycles.

Data collection and analysis

The primary objective of this study was not to measure a linear shift in teaching practices via a pre- and post-intervention comparison. We employ a descriptive qualitative approach to identify salient examples of inclusive/affirming and exclusionary/deficit storylines co-existing in the classrooms of teachers participating in our CSPD. Our goal is to provide a nuanced account of how translanguaging practices serve as a

catalyst for inclusive storylines, thereby dismantling the deficit-based views typically applied to EBs.

To achieve this, we collected a dataset spanning one academic year for each teacher, consisting of video recordings and verbatim transcripts from three phases: pre-CSPD (pre-interview, lesson observation, and reflection), during-CSPD (seven cycles of co-planning, co-teaching, and co-reflection), and post-CSPD (lesson observation, reflection, and post-interview). Semi-structured interviews elicited teachers' baseline and evolving reflexive positioning regarding their roles and interactive positioning regarding EBs' competencies in mathematics. Each lesson reflection probed teachers to analyze student participation, efficacy of lesson strategies, and moments of student struggle or success. The co-teaching and lesson observations captured the real-time positioning between teachers and EBs in their classrooms.

Data analysis followed reflexive thematic analysis (Braun & Clarke, 2021) using a theory-informed, abductive approach (Saldaña, 2021), which facilitated an iterative dialogue between the empirical data and the developed framework. The unit of analysis was the positioning act, conceptualized as a multimodal discursive event encompassing both teacher discourse and pedagogical actions. Specifically, we defined a positioning act as any linguistic or instructional move that assigned an intellectual capability or academic identity to a student within the mathematical community. Codable acts included instances where teachers explicitly positioned EBs along asset- or deficit-based spectrums (e.g., assigning identities such as "Capable Math Doers" or "Passive Learners"). Conversely, general classroom management, neutral logistical directions, or objective pedagogical descriptions were excluded from coding for positioning acts, as they did not attribute a capability-based identity to the student.

Following Saldaña's (2021) coding cycles, the research team implemented a three-stage abductive process to bridge empirical actions with theoretical storylines: (1) Researchers reviewed transcripts to identify meaningful positioning acts, using our framework (Table 1) as a set of sensitizing concepts to track how teachers positioned both themselves (reflexive) and their students (interactive). (2) Through iterative team meetings, initial codes were synthesized within Dedoose into broader, distinct positions (e.g., Contributor or Supporter) based on systemic patterns of meaning across the dataset. (3) These derived positions were categorized into our two overarching theoretical storylines: exclusionary/deficit (monolingual) or inclusive/affirming (translanguaging). Table 3 provides examples of these acts, their associated positions, and corresponding storylines.

To ensure analytical rigor, transcripts for each academic year were assigned to researcher pairs for independent coding. Subsequent triangulation meetings involving all three coders were used to refine the coding manual. Once finalized (see Appendix), all transcripts were re-coded to maintain systemic consistency. Following Maxwell (2010), we utilize descriptive numerical counts within this qualitative design not to claim statistical generalizability or definitive post-intervention outcomes, but to map internal variance and identify the distribution of specific positioning configurations. While code frequencies were recorded to flag broad structural trends, our primary focus remained on the qualitative nuance of the discourse, recognizing that a singular, powerful moment of inclusion is often more substantively meaningful than raw frequency in positioning analysis.

Table 3 Examples of acts, positions, and storylines coding process

Positioning Act	Position	Storyline
“When I saw one particular student who had found a way to come up with a function of an inverse function, actually, and I was like, so [...], what did you do? How’d you come up with that? And then, he kind of explained, and I turned to the [different] student I was kind of trying to get to get there. So why do you think he did that? You know, like, I know I kinda facilitated that to her asking questions.”	<i>Facilitator</i> (reflexive)	Inclusive/Affirming Storyline
“A lot of them were using Spanish to talk to their peers and to write in Spanish. And I think it’s easier to do math when you’re thinking in your first language, just because you don’t have to translate to another language and translate to math.”	<i>Culturally and Linguistically Responsive Teacher</i> (interactive).	
“Copy, guys. Let’s pick our heads up. Let’s copy.” “I use a lot of direct instruction. So we take notes. Uh, I do print worksheets with, like, blanks on ’em so they can follow along. We do a couple of examples together, and then I give them time.”	<i>Direct Instructor</i> (reflexive)	Exclusionary/ Deficit Storyline
“I have a feeling it’s gonna be a lot of sitting there not knowing or just guessing random numbers that make no sense.”	<i>Passive Learner</i> (interactive)	

Findings

The findings of this study demonstrate that teachers do not follow a uniform or linear progression from exclusionary to inclusive practices; rather, they navigate both Exclusionary/Deficit and Inclusive/Affirming storylines simultaneously. While the overall dataset showed a higher prevalence of acts aligned with inclusive storylines ($n=5827$) than deficit storylines ($n=2394$), these frequencies varied significantly across participants (see Table 4).

This investigation is part of a larger, ongoing research program focused on the inclusive and exclusive positioning of EBs within PD spaces. Consequently, we move beyond a purely quantitative comparison to prioritize the qualitative nuance and analytic generativity of these interactions. By prioritizing the stories of these positioning acts and storylines, we aim to capture the complexity of how teachers negotiate power and linguistic agency in real-time.

A critical discovery during our iterative coding process was that positioning does not occur in isolation but operates through a reciprocal relationship between how teachers view their own role and how they view their students. We identified a consistent pattern where specific reflexive positions were fundamentally tied to, and often served as a catalyst for, specific interactive positions. To demonstrate this mechanism

Table 4 Count of reflexive and interactive positioning with exclusive and inclusive storylines

Teacher	Exclusive/Deficit Storylines			Inclusive/Affirming Storylines		
	Reflexive	Interactive	Total	Reflexive	Interactive	Total
Harper	20	88	108	100	225	325
Norris	119	385	504	602	1046	1648
Richardson	164	343	507	404	589	993
Ellis	71	246	317	437	396	833
Horton	136	306	442	406	549	955
Rodriguez	105	411	516	518	555	1073
Total Count	615	1779	2394	2476	3360	5827

of identity and power negotiation, the following sections are organized into themes that pair the reflexive and interactive positions within each storyline. This structure allows us to unpack how specific equity-oriented translanguaging practices concretely reshape student participation and challenge traditional monolingual norms, regardless of a teacher's background or experience level.

Exclusionary/deficit storylines: monolingual stance

Within this stodeficit storylines: monolingual styline, teachers' reflexive positioning as sole knowledge providers often leads students to be interactively positioned as passive learners and learners with difficulties. Teachers occasionally expressed feeling under-resourced, implicitly suggesting that available materials and institutional support primarily cater to non-EB students.

Teachers in power and passive learners

When teachers reflexively positioned themselves as a "Person in Power" or a "Direct Instructor," they centralized classroom authority, hampering students' identities as active mathematical thinkers. This stance fostered a rigid power hierarchy where the teacher held exclusive authority and knowledge, leaving minimal room for student agency. Correspondingly, this reflexive dominance mandated an interactive positioning of EBs as passive learners within predominantly teacher-led environment. For example, Ellis articulated this approach in her pre-interview: "I use a lot of direct instruction. So, we take notes. I print worksheets with blanks on them, so they follow along. We do a couple of examples together, and then I give them time." By designing heavily scaffolded, blank-filling tasks, Ellis constricted both linguistic and cognitive space, pre-determining EBs as passive recipients who lacked the agency to initiate mathematical thought.

This deficit loop is reinforced when teachers misinterpreted EBs' coping mechanisms in monolingual environments as inherent student preferences. Norris noted that some students wanted a "regimented know exactly how to do it" approach, further reinforcing passivity. Rather than recognizing this "regimented" desire as a defense mechanism in a monolingual classroom, the teacher's positioning labels the students as naturally passive. Richardson's lesson on quadratic equations provided a clear example of this intersection of power, identity, and language barrier manifests

in practice (see [Appendix](#)). By enforcing a rigid, step-by-step algorithm in English, Richardson expected structural power that silenced EBs. Because the task offered little conceptual negotiation and flexible language use, EBs were barred from bringing their authentic identities into the discourse, forced instead to conform to a rigid script.

Consequently, these acts fed into teachers' deficit perspectives, positioning EBs as passive learners or unwilling to learn. This includes perceiving EBs as primarily capable of mimicry ("a lot of my EB students are really good mimicking"), believing EBs preferred passive learning ("some want a regimented know exactly how to do it"), or avoid participation ("the ones who aren't necessarily willing to participate"). By framing a lack of oral participation as an individual deficit rather than a systemic failure to implement translanguaging pedagogy, the teacher blamed the student. The anxiety of speaking English publicly was treated as a student deficiency rather than an institutional barrier, where English was considered as the sole currency of intelligence.

We found a high percentage of co-occurrence between reflexive positioning and interactive positioning in this storyline, specifically pairing "Direct Instructor" with "Passive Learner" and "Person in Power" with "Unwilling to Learn." For instance, when teachers immediately provided answers ("You're going to write an equation, it's 57 minus x "), they positioned themselves as the sole knowledge provider and EBs as passive learners. These paired positions in the deficit storyline afforded EBs little opportunity to communicate their mathematical understanding, reinforcing the teacher as the absolute authority while positioning students as low performers and mere direction-followers.

Under-resourced and learner with difficulties

The deficit orientation within this storyline is structurally reinforced by teachers reflexively positioning themselves as victims of institutional scarcity, specifically regarding financial, linguistic, and temporal resources. Teachers frequently felt constrained by external factors, including financial limitations ("I couldn't do that every day in my class, just financially," referencing materials provided by the research team), rigid district pacing calendars, or personal linguistic limitations ("He didn't know it in English, and I didn't know it in Spanish"). This perceived inability to meet EBs' needs led teachers to view EBs' diverse linguistic backgrounds as an instructional hurdle rather than a resource.

This sense of scarcity was particularly pronounced when instructional time was treated as a finite resource. Richardson explicitly compared EBs' performance unfavorably to non-EBs, stating, "In the non-EB class, I can just do things quicker. I don't have to stop and explain something. I don't have to show up with a video, so we can just cover more content." This perspective reveals a monolingual stance that equates instructional speed with academic success. By framing multimodal supports (e.g., videos) as obstacles to content coverage, Richardson positioned EBs' linguistic needs as deficits hindering classroom progress. This view prioritized a fast-paced monolingual delivery over a translanguaging space, excluding EBs by casting their need for varied semiotic resources as an inefficient deviation from the norm.

This lack of linguistic equity often manifested in a sameness-based approach to instruction, where a refusal to implement translanguaging was masked as fairness. For instance, Horton rationalized sticking strictly to English because we could not find translations for every student's native language (e.g., Karen). He chose to withhold all translanguaging support rather than leave a few students without it. While seemingly equitable on the surface, this approach aligns with a sameness-based view of equity rather than the fairness-based dimensions articulated by Gutiérrez (2002, 2012) and Esmonde (2011). By enforcing "sameness," Horton reflexively positioned himself as an impartial equalizer, but interactively silenced EBs by stripping away their right to use their full linguistic repertoires to negotiate complex mathematical tasks.

Even bilingual teachers expressed frustration when navigating the realities of classroom superdiversity. Ellis articulated this constraint in her post-interview: "I do not do a good job incorporating other languages other than Spanish just because I don't have that background, and with how many languages I have, there would be extra steps I need to do." This reflexive positioning as an under-resourced instructor allowed her to rationalize the suppression of translanguaging for non-Spanish speaking EBs as a logistical impossibility ("extra steps"). Consequently, students who spoke fewer common languages were positioned as inherently more difficult to teach, restricting their access to differentiated mathematical tasks.

Teachers frequently attributed EBs' difficulties in accessing mathematics problems to their limited English proficiency ("his English is so limited that I don't know if he understands what's being asked of him ever"). Framing students' language proficiency as a permanent cognitive barrier rather than critiquing the monolingual delivery of the task, reinforced a deficit storyline in which EBs were viewed as perpetual "learners with difficulties" who were fundamentally incompatible with rigorous mathematical inquiry.

Inclusive/affirming storylines: translanguaging stance

Within this storyline, teachers reflexively positioned themselves as culturally and linguistically responsive educators, a stance rooted in their deep valuation of EBs' multilingualism and multiculturalism. This ideological foundation enabled teachers to establish safe, student-centered spaces where diverse languages and cultures were actively validated. Functioning as learning facilitators, these educators shared classroom power and expertise, fostering environments where student contributions were critical to collaborative knowledge construction. This inclusive positioning, in turn, empowered EBs as capable mathematical problem solvers who could persevere through complex conceptual tasks with targeted teacher support (DiNapoli & Morales, 2021). The reciprocal connections between reflexive and interactive positioning within the affirming storyline manifest in three mutually influencing themes, detailed below.

Culturally and linguistically responsive teachers and valuable multilingual/multicultural members

In the inclusive/affirming storyline, teachers validated students' lived experiences and affirmed their full linguistic repertoire as mathematical assets. Coding revealed a high co-occurrence between the codes "Culturally and Linguistically Responsive Teacher" and "Valuable multilingual/multicultural member," demonstrating that EBs were interactively positioned as intellectually valuable members whose multicultural identities enriched the collective mathematical discourse. This was achieved by explicitly connecting mathematics to real-world context (e.g., World Cup, hourly wage) and actively encouraging home-language use.

Teachers' acts centered on problem context and language flexibility, effectively redistributing power by anchoring mathematical tasks in student expertise. During co-planning, Harper chose the World Cup as a problem context, recognizing her students' passion for soccer, "I really liked the soccer one because it was around the time of the World Cup, and it is something that most of the students were really passionate about. So, it was a good connection." Similarly, Horton favored a global context because "the best point of bringing in that global context is something that the kids really respond well to [them]." By integrating these familiar contexts, teachers transformed the mathematical space from one of exclusion to one of shared authority.

Regarding language use, all teachers encouraged EBs to speak and write in their home languages, viewing it as "helping students learn math," "a really good asset," and "the best way that they can [learn]." This deployment of translanguaging dismantled the traditional, monolingual power structures of the classroom. For example, Ellis noted that her Spanish proficiency facilitated a deeper, trusted relationship with her students:

Once they learned I spoke Spanish, the relationships really flourished. And so this year, I started off with Spanish. And so building that relationship, especially with my new students, I think, is more important right now, so that they're willing to ask questions and learn and everything like that.

By using Spanish, Ellis shares linguistic power, humanizing the classroom, and allowing EBs to safely explore their identities as confident mathematical communicators.

To bolster this pedagogy, the research team designed activities that valued students' multilingual identities. An initial student introduction activity required sharing name pronunciation, home countries, and languages spoken. This provided teachers with novel insights that disrupted generic cultural assumptions. Norris reflected on this after her first co-teaching lesson:

I didn't know so many of my students knew so many languages, like the Swahili girls that also do French... And then, a couple of people I had thought were from Mexico [but from a different Latin country]. I guess I generalized... So, that was kind of nice. [...] So I suppose that was just kind of an eye opener.

Norris's "eye-opener" illustrates a profound change in positioning. By exposing her own previous generalizations, she moves away from deficit framing and begins interactively positioning her students as linguistically rich contributors.

Additionally, displaying translation slides for main mathematics problems in all students' languages and inviting students to read aloud promoted immense pride and visibility. Richardson noted, "The kids just feel pride. Like, I mean, like Imar [pseudonym] when he got to say that in Pashto, like it, he felt cool doing it." This practice served a political act of visibility; elevating minoritized languages like Pashto alongside English inverted traditional classroom power dynamics. This layout directly fostered increased participation during group work, as evidenced by Norris's case study of a student "Contributor" (see [Appendix](#)).

Finally, all lessons concluded with a math journal where EBs were encouraged to use their home language or symbolic drawings. Ellis observed, "A lot of them were using Spanish to talk to their peers and to write in Spanish. And I think it's easier to do math when you're thinking in your first language, just because you don't have to translate to another language and translate to math." By recognizing that students should not face a double translation burden (linguistic and mathematical simultaneously), Ellis validated translanguaging as an essential cognitive vehicle. The journal functioned as a safe translanguaging space that transformed potential linguistic frustration into mathematical agency, shifting students' interactive positioning from passive direction-followers to active authors of mathematical thought. Teachers cultivated this safety by prioritizing strong relationships and, as Rodriguez summarized, "embracing them for who they are."

Cognitive demand task providers and capable math doers

All teachers consistently positioned EBs as capable mathematical doers by providing cognitively demanding tasks, as emphasized during CSPD. This stance is underscored by a high co-occurrence between the codes "Cognitive Demand Task Provider" and "Capable Math Doer" within this storyline. When teachers reflexively step into the role of a cognitive demand task provider, they directly facilitate the interactive positioning of EBs as capable math doers. This was evident when they acknowledged the need for additional challenges to enhance engagement, as in Harper's case. She prepared an extension activity for students she anticipated would find the main activity too easy: "Then you have a challenge as a group to see if you can make a new path for a bird. Like a fourth one that we didn't see." Norris similarly established high expectations for her entire class during a co-planning session: "I think we could do more difficult [things] than that. I mean, I think most of my kids could solve that one." Furthermore, Horton explicitly compared his EB-only class to his non-EB-only class, positioning some of his EB students as even more capable: "And now, I have a small group of students, whom I'm giving problems that my gen ed students would struggle with." These instances demonstrate that teachers did not perceive language as a barrier to mathematical capability for EBs; instead, they maintained high levels of cognitive demand and prepared EBs for requiring additional enrichment.

As a cognitively demanding math task provider, Horton intentionally designed opportunities to push students' mathematical reasoning through probing questions.

Using a task comparing two jobs with different wages and sign-on bonuses, he chose McDonald's and Target as familiar and favorable job places for his students. Although solutions involved setting up and solving systems of linear equations/functions, various approaches, such as tables and graphs, were possible. His challenge question was, "When is it better to work at McDonald's?" He explained:

This was at the end when they were comparing the graphs, and we know that at the very end, it's better to work at Target, but asking them, "When is it better to work at McDonald's? When do you make more money?" That was kind of a nice challenge question.

In this excerpt, Horton's aim was to guide students to find the intersection of the two functions where their total pay would be equal, and to analyze the pay increase as a continuous function rather than a single calculation. He also planned for students to interpret mathematical results within the given real-world context, such as determining which job offered better compensation over specific time periods. Through this intentional framing, Horton acts as a cognitively demanding math task provider, giving challenging tasks to EBs and structurally inviting them to claim an identity as rigorous math doers.

To help EBs engage with such cognitively demanding tasks, teachers actively positioned themselves as providers of challenging math tasks while systematically lowering linguistic barriers. For instance, they explained terms like "wage." While bilingual teachers provided direct translation for Spanish-speaking students, monolingual teachers employed strategies such as using synonymous vocabulary, speaking slowly, using pointing/gestures, providing support with understanding English words, and arranging seating to facilitate peer assistance. By providing these targeted scaffolding mechanisms, the teachers ensured that linguistic complexity did not dilute the cognitive load of the mathematics. Ultimately, this approach directly disrupts the deficit myth that EBs require simplified, low-level procedures; instead, equity-oriented scaffolding allows EBs to thrive as capable math doers within rigorous, high-demand academic spaces.

Power dynamics by empowering emergent bilinguals

Within inclusive/affirming storylines, classroom power dynamics were configured to fundamentally empower students. When teachers stepped away from traditional authoritative roles, structural control was redistributed. This power reconfiguration is characterized by the high co-occurrence of "Supporter" with "Active Learner," "Facilitator" with "Contributor," and "Co-builder and Co-learner of Knowledge" with "Contributor." Collectively, these configurations demonstrate that when teachers yield structural authority, they dismantle monolingual and transmissionist barriers. This creates a dual opening: teachers decenter their own authority, enabling EBs to shed passive labels and assume active, expert identities within the mathematical community.

The intersection of the "Supporter" and "Active Learner" configuration were visible when teachers structure mathematical tasks to promote student autonomy. For

instance, Richardson reflexively positioned himself as a facilitator, interactively positioned his EBs as active learners by challenging them to explore meanings rather than memorizing definitions: “I could just tell you what it [standard deviation] means... The better way is if we explore changing numbers and we try to figure out together what this means.” By decentering his authority, Richardson created a translanguaging space where students could use their collective semiotic resources (e.g., home languages, gestures, and numerical patterns) to explore complex concepts.

Teachers also expressed excitement upon observing their EBs actively engaging. Ellis shared her enthusiasm when a group of EBs collaborated to set up equations: “They were definitely learning and working, and that group you’re talking to is pretty low English. And so that was pretty cool to see them working.” By explicitly acknowledging that students were “definitely learning and working” despite linguistic barriers, she decoupled mathematical capability from English proficiency. This discourse challenges the deficit storyline by showing that linguistic differences do not impede cognitive processing. Horton similarly noted how a histogram task activated a “Facilitator/Contributor” dynamic, spurring deep discussion among his EBs:

The students navigated that wonderfully and were able to go...That makes sense to me...And so the students came up with their own way to make sense of that...They were saying, hey, 20 is a bigger number than 10, so it should go in the bigger interval. And I really liked how they explained and talked about that because I had never heard that before.

By facilitating rather than intervening, Horton validated their mathematical agency and sense-making strategies as recognized classroom expertise.

When classroom power was shared most deeply, the storyline advanced to a co-occurrence of “Co-builder and Co-learner of knowledge” alongside students as essential “Contributors.” Ellis frequently asked students how to say words in Spanish, reflexively positioning herself as a co-learner and the students as experts. The following dialogue during an exponential task illustrates this fluid co-construction of knowledge over the direct transmission of a solution:

Student: *¿Dónde está para borrar?* 64 [Where is it to delete? 64] *No, no, no, espérese, ya sé cómo se hace, 128. Puedo hacerlo dividido. sí, ¿verdad?* 64, *de 64* [No, no, no, wait, I know how to do it, 128. I can do it divided. Yes, right? 64, 64].

Teacher: *Entonces que no es 64 multiplica con 8 o con 16, es 64 multiplica con qué?* [So it’s not 64 multiplied by 8 or 16, it’s 64 multiplied by what?]

Student: *con dos* [with two].

Teacher: *Entonces si tienes este número que necesitas multiplicar para recibir...* [So, if you have this number that you need to multiply to receive...].

Student: *Puedo hacer...* [I can do...] 128 multiply two?

Teacher: Yeah.

Students: *inaudible, 200 y algo, inaudible, por dos son ciento...* *inaudible* [inaudible, 200 and something, inaudible, times two are a hundred... inaudible].

Teacher: Yeah. My gosh, good job. *¿Por qué multiplica por qué número cada vez?* [Why does it multiply by what number every time?]

Ellis responded fluently and seamlessly to the student's Spanish questions with Spanish prompts, thereby legitimizing the student's entire linguistic repertoire. Instead of treating Spanish as an instructional accommodation, she treated it as the central medium for mathematical thought. When the student experienced initial conceptual confusion regarding operations, Ellis deliberately maintained her positioning as a co-builder rather than stepping in with direct instruction, allowing the student to successfully author the mathematical solution.

across these acts of active learning and co-building, teachers consistently positioned EBs as vital contributors. They effectively communicated that students' languages, cultures, and mathematical ideas belonged in the discourse. Reflecting on a post-observation lesson, Ellis summarized this, "One of my students was helping them, and then the three new girls in the front were working together for the first time on this stuff. And it's nice because they're in groups, they can help each other." Her observation highlights how she positioned her students not only as capable math doers but as cooperative owners of the learning space.

Discussion

Our findings demonstrate that translanguaging serves as a transformative pedagogical lever for equity, expanding fair opportunities to learn by repositioning EBs as mathematically capable agents. This shift directly addresses Gutiérrez's (2012) Identity and Power dimensions of equity, redefining competence and authority within the learning space. By empowering EBs to use their full linguistic repertoires, teachers can dismantle rigid monolingual systems (García, 2017; Yilmaz, 2021) and transform curricula to address the power dynamics inherent in traditional instruction (Cervantes-Soon et al., 2017).

A crucial insight from this study is the persistence and subtle manifestation of deficit storylines. Even amidst inclusive attempts, these narratives often persisted, rooted in pervasive monolingual norms (MacSwan, 2017; Yilmaz, 2021). While labels like "passive" or "unwilling" are not exclusive to EBs, the presence of a language barrier provides a unique rationale for their application, often conflating a need for processing time with a lack of proficiency. These views are frequently intertwined with teachers' feelings of being "Under-resourced," where systemic constraints inadvertently reinforce positions as "Learners with Difficulties" (Esmonde, 2011), particularly when teachers maintain a "Direct Instructor" stance that limits student agency. However, by introducing a translanguaging framework, teachers are prompted to critically reflect on these institutional barriers, allowing them to counter-interpret student silence not as a cognitive deficit, but as a structural challenge that requires a pedagogical shift.

While student-centered pedagogies are broadly recognized as effective, de-centering teacher authority is a vital linguistic intervention for EBs. In teacher-directed environments, the "Person in Power" dictates the pace, often silencing EBs who require additional processing time or peer collaboration to bridge language gaps. By shifting away from direct instruction, teachers remove monolingual gatekeeping, allowing EBs to leverage their full linguistic assets to engage with rigorous content.

This reflexive positioning transformation from direct instructors to co-builders of knowledge transforms interactive positioning from passive recipients into active co-constructors (Davies & Harré, 1990; Kayi-Aydar & Miller, 2018), which is essential for equity (Cervantes-Soon et al., 2017).

Specific strategies—culturally relevant contexts (Gutiérrez, 2012), home-language journals, and translation aids—fostered this environment. During the CSPD, implementing challenging mathematics using linguistic assets often provided teachers with aha moments, shifting their perceptions as they witnessed EBs' mathematical brilliance. Such acts align with translanguaging principles that leverage strengths as intellectual resources (Yi et al., 2024) and maintain high expectations (Willging & Oliveira, 2023). Ultimately, affirming bilingual identities reduces performance anxiety and rehumanizes mathematics (Gutiérrez, 2012) by valuing students' unique experiences (Creese & Blackledge, 2015). By cultivating dignity, translanguaging ensures EBs are not just reproducing teacher ideas but are valued members of the mathematical community (DiNapoli & Morales, 2021; Langer-Osuna & Nasir, 2016).

Limitations, implications, and future research

This study is subject to several limitations. First, the small sample of six teachers in one urban district limits generalizability. The observed transformations in teacher stance and positioning configurations cannot be assumed to represent universal trajectories for all mathematics educators. Second, as researchers actively embedded in both the PD delivery and the subsequent co-teaching processes, our dual role as facilitators and observers introduced an unavoidable researcher footprint. Our active involvement in shaping scaffolding strategies inevitably influenced classroom dynamics and teacher discourse, thereby likely shaping the frequency and nature of the inclusive practices observed. Finally, a significant conceptual limitation of this work is the absence of direct student perspectives. Although it is not the scope of this study, we lack the self-reported, lived experiences of the EB themselves.

Consequently, our results suggest that PD must transcend technical training to explicitly challenge beliefs about language and power, specifically confronting deficit narratives like “unwillingness” storylines (MacSwan, 2017; Yilmaz, 2021). Effective PD should empower teachers to examine how their reflexive positioning shapes their interactive positioning of students (Davies & Harré, 1990; Kayi-Aydar & Miller, 2018), while utilizing concrete activities like translation slides to cultivate asset-based views of EBs (Yi et al., 2024; Willging & Oliveira, 2023).

Future longitudinal studies are needed to investigate the sustainability of these positioning shifts and their long-term impact on EBs' mathematical learning and identity (Langer-Osuna & Nasir, 2016). Research should also incorporate EBs' own perspectives to provide a student-centered lens on classroom dynamics (Darragh, 2016). Additionally, investigating why some teachers show minimal shifts despite support could illuminate the ingrained beliefs or contextual barriers that impede change.

Ultimately, leveraging EBs' linguistic and cultural repertoires is an ethical imperative. This research joins the call to embrace multilingualism as a profound asset, ensuring all learners are positioned as capable and empowered to engage with mathematical inquiry, thereby rehumanizing the learning experience (Gutiérrez, 2012).

Appendix

Translanguaging storyline codebook

Code/Position	Count	Description	Example
Exclusionary/Deficit Storylines (Monolingual Stance)			
<i>Reflexive Positioning: The teacher positions themselves as...</i>			
Direct Instructor	60	The only conveyor of knowledge and provides more support than needed.	"Okay, step five. I then rewrite my equation, x minus three squared equals a hundred. Next, I now get to solve this... So I'd take my square root of a hundred, and that's going to be 10 or negative 10."
Person in Power	387	The only person in the classroom who has the power to command/direct students' actions and make decisions.	"No, you got to, everyone has to write their age up here. Go ahead."
Under-resourced	168	The one unable to support EBs or has no/little resources/skills/knowledge to support EBs.	"The Spanish speakers I can communicate with very effectively. It's a struggle for everybody else."
<i>Interactive Positioning: The teacher positions EBs as...</i>			
Learner with Difficulties	1313	Learners who face multiple challenges, frequently characterizing them as lower-performing or slower than their non-EB peers.	"Our pace has been very slow...I don't believe it's language barriers for the majority. Some. Yes. We're just discovering all kinds of interesting math knowledge gaps."
Passive Learner	51	Learners who only passively follow the teacher's directions or receive/accept knowledge.	"Copy, guys. Let's pick our heads up. Let's copy."
Unwilling to Learn	336	Non-participative in class work by their choice.	"So, the ones who aren't necessarily willing to participate, the one who came in late and put his head down... We talked about where he should sit, and he chose not to."
Unwilling to Speak	79	Quiet in classrooms due to their personality, relationships, or culture.	"I think she's just a little shy. I don't know, maybe she doesn't have any friends here, that could probably be. It's true, but some cultures do like, where women aren't supposed to talk to men."
Total	2394		
Inclusive/Affirming Storylines (Translanguaging Stance)			
<i>Reflexive Positioning: The teacher positions themselves as...</i>			
Co-builder and Co-learner of knowledge	126	A learner who can gain knowledge from and collaborate with students in building math work.	"T: Can you draw the arrow, how do you say, arrow [in Spanish]? S: Flecha."

Translanguaging storyline codebook

Code/Position	Count	Description	Example
Cognitively Demanding Math Provider	397	The one who provides EBs with cognitively demanding math tasks and maintains/increases the cognitive demand of the tasks.	"One of the easier ways that I challenged students was I'd throw in outliers. I'd ask, could you do this differently? What if we changed this?"
Culturally and Linguistically Responsive Teacher	419	Inclusive and accommodating of students' diverse cultures and languages, by integrating their cultural and linguistic backgrounds into math lessons.	"If they have to do it in their own language, go for it...I would never discourage them from doing their own home language...they can do it in their own language and explain it in their own language. I feel like that's a big way to do it."
Facilitator	67	A facilitator or coach to guide students' discussion/reasoning rather than giving directions only.	"We have Javier [pseudonym], I'm wondering what you wonder and notice, and you can say it in Spanish, and then another student will tell me."
Safe Space Creator	74	The one who can create a safe and comfortable learning space/environment for EBs.	"Hearing them speak their own language and hearing the support they get from their peers, I think, is a really good asset for them or a supportive thing for them where they do have that comfortability."
Supporter	1370	A supporter who helps EBs learn math by providing scaffolding, such as explanations about the given context, guiding questions, or translation.	"Let me give you an example of this. My daughter works at a restaurant, and so when somebody pays for the food, they leave a tip...the busier the restaurant is, the more money my daughter makes. My daughter works right now on Mondays, Wednesdays, Saturdays, and Sundays. Which days do you think my daughter makes the most money?"
<i>Interactive Positioning: The teacher positions EBs as...</i>			
Active Learner	311	Active and independently participating in math discussions and making decisions, rather than merely following the teacher's directions.	"Okay, so as a group, you need to come up with a plan, and you need to come up with what information you need from me."
Capable Math Doers	1159	Competent mathematics problem-solvers who can learn or do challenging math tasks.	"I think we could do more difficult than that. I mean, I think most of my kids could solve that one."
Contributor	2034	Contributors who provide important knowledge, skills, and ideas, such as participating in instruction or helping peers.	"We definitely saw communication across the room when there were wrong answers or when they're trying to help each other out, during our identification of the graph parts, in their working at their tables. Yes, there's definitely some talking in their own language. So yeah, I would say that the classroom is rich with that today."
Valuable multilingual/multicultural member	278	Valuable members, recognizing their cultural and linguistic resources as significant instructional assets.	"So, we give them the equation and then they figure out what is an example to go with, and then they can also share that with their friends or their tablemates or in different languages."

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Declarations

Ethical approval This research study was approved by the Institutional Review Board at Iowa State University. All participants provided informed consent prior to their involvement in the study.

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