



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.