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Deficit Discourses in Action: Mathematics Teachers' Attributions of Student Failure in Problem Solving

Brantina Chirinda

Graduate School of Education, University of California, Berkeley, USA

Email: brantinac@berkeley.edu

Corresponding author:

Brantina Chirinda
brantinac@berkeley.edu

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Abstract

Student struggles in mathematical problem solving remain a defining feature of South African classrooms. In many cases, teachers respond to persistent student difficulties by attributing them to the students themselves—citing laziness, lack of motivation, or limited ability. This study examined how teacher blaming emerges in classroom discourse and its implications for pedagogical practice. Drawing on interview data from seven South African secondary mathematics teachers, I examined narratives of student failure using attribution theory and critical discourse analysis. The findings reveal that teachers frequently construct failure as an internal, stable, uncontrollable trait of the student. I argue that these blame narratives reinforce deficit thinking and obscure structural, linguistic, and pedagogical barriers to equitable mathematics learning. Findings highlight how deficit narratives sustain inequitable participation, underscoring the need for professional development that reorients teachers' beliefs toward reflective, equity-based pedagogy.

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INTRODUCTION

Student underachievement in mathematical problem solving (MPS) continues to dominate national and regional educational discourse in South Africa and worldwide. Assessment cycles consistently show that students perform poorly on non-routine problems that require reasoning, explanation, or the transfer of concepts to unfamiliar contexts. National Senior Certificate reports and international benchmarking assessments confirm these concerns in South Africa. The 2018 South African National Senior Certificate Examination Technical Report highlighted that the majority of candidates struggled with multi-step reasoning problems (DBE, 2018). Similarly, findings from the 2018 Trends in International Mathematics and Science Study (TIMSS) showed that South African Grade 9 students ranked significantly below the international average in problem-solving domains (Reddy et al., 2019). These findings highlight a persistent challenge in cultivating mathematical reasoning and sense-making among secondary school learners.

Persistent performance gaps cannot be understood without considering the broader educational landscape that shapes mathematics learning in South Africa. Nearly three decades after apartheid, inequalities in language of instruction, resource allocation, and pedagogical quality continue to influence classroom

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participation and outcomes (Chirinda et al., 2023). Understanding how teachers interpret these persistent learning challenges is therefore crucial for addressing both the pedagogical and equity dimensions of MPS. While prior studies have examined pedagogical barriers (e.g., Chirinda, 2021; Shalem & De Clercq, 2019), less is known about how teachers linguistically construct blame for student failure. This study addresses that gap by analysing how teacher discourse reflects attributional patterns that sustain deficit perspectives in mathematical problem solving.

Despite strong policy emphasis on promoting conceptual understanding and mathematical reasoning, classroom observations reveal that instruction often remains procedural, teacher-centered, and examination-driven (Chirinda, 2021). Teachers frequently prioritise rote procedures and algorithmic repetition over discussion, exploration, and justification. As a result, students experience limited opportunities to engage in productive struggle or to develop deep conceptual connections (Schoenfeld et al., 2023). Shalem and De Clercq (2019) argue that the dominant pedagogical culture in many South African schools prioritizes coverage and compliance over inquiry and reflection, a pattern reinforced by accountability pressures and resource constraints. This emphasis on curriculum coverage over reflective practice may also shape how teachers interpret student difficulties—encouraging attributions that locate failure within the learner rather than within pedagogical design.

Language further compounds these difficulties. Mathematics is taught in most South African public schools in English, even though it is not the students ' home language. The cognitive demand of decoding mathematical text in a second language contributes significantly to misinterpretation and conceptual misunderstanding (Mostert & Roberts, 2020). Teachers, however, often fail to recognise language as a legitimate source of difficulty. Instead, they interpret students 'errors as signs of limited ability or lack of effort. In multilingual classrooms, such interpretations can mask structural and linguistic barriers, reinforcing inequitable participation (Battey & Franke, 2015).

A recurring feature within this context is teacher blaming—the tendency to attribute students 'mathematical struggles to internal deficits, such as laziness, lack of motivation, or low intelligence. This pattern exemplifies deficit discourse, in which responsibility for learning failure is attributed to the student rather than to teaching practices or systemic factors (Chirinda et al., 2023). When teachers adopt such attributions, they often justify traditional instructional methods and overlook opportunities for reflective practice.

Deficit perspectives are particularly pronounced in under-resourced schools serving Black students, where historical inequalities intersect with contemporary accountability pressures. These narratives not only reproduce stereotypes of limited ability but also obscure the structural and linguistic barriers that shape students ' participation in MPS. Understanding how such deficit discourses operate in teachers 'talk can illuminate hidden mechanisms of inequity and reveal how everyday explanations of failure sustain broader patterns of exclusion.

This study focused on teacher blaming as a specific manifestation of deficit thinking within mathematics education. Blaming students for failure is not merely an emotional reaction; it reflects deeper belief systems about ability, effort, and fairness. Attribution Theory (Weiner, 1986) provides a valuable lens for

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understanding how teachers explain students' difficulties and how these explanations influence their instructional responses. Teachers who attribute failure to internal, uncontrollable factors—such as low ability—are less likely to modify their pedagogy or offer additional support. In contrast, those who attribute challenges to more controllable factors, such as teaching strategies or learning effort, are more inclined to adopt adaptive and reflective practices.

In South Africa's post-apartheid educational landscape, such attributions are also deeply social and political. This study, therefore, combines Attribution Theory and Critical Race Theory (CRT) (Delgado & Stefancic, 2012; Martin, 2009) to explore the psychological and sociocultural dimensions of teacher blame. Understanding these dynamics is essential if mathematics classrooms are to become more equitable and supportive spaces for MPS.

In this study, I analysed interview data from seven South African secondary mathematics teachers to examine how they attributed blame for students 'failure in MPS. The purpose was not to criticise teachers individually but to illuminate how blame functions within broader pedagogical and systemic contexts. Accordingly, this study addresses the following research questions:

1. How do teachers construct blame when students fail to do mathematical problem solving?
2. What implications do these blame attributions have for teaching practice and educational equity?

By interrogating teacher blame as both a psychological and sociocultural phenomenon, this study contributes a nuanced understanding of deficit discourse in mathematics education. Recognising and transforming deficit-based attributions is crucial for cultivating reflective practice, sustaining student engagement, and advancing the goals of social justice in mathematics education.

Theoretical Framework

Building on Attribution Theory (Weiner, 1986) and CRT (Delgado & Stefancic, 2012) introduced earlier, this study interprets teacher blaming not merely as an individual cognitive process but as a socially situated discourse. Attribution Theory explains how individuals assign causes to success or failure along three key dimensions—locus of causality (internal vs. external), stability (stable vs. unstable), and controllability (controllable vs. uncontrollable)—which influence their emotions and subsequent behaviours. Within educational contexts, such attributions shape teachers 'expectations, motivation, and instructional decisions. Teachers who perceive student failure as stemming from internal, uncontrollable factors, such as low ability, tend to feel less responsible for intervention and are less likely to modify their teaching.

While Attribution Theory illuminates the psychological logic of blaming, it does not account for the social and historical forces that make certain attributions more prevalent or acceptable. CRT complements this by foregrounding how racialised and structural inequities are reproduced through everyday discourse and practice. CRT reveals how deficit narratives—such as perceptions of laziness or lack of discipline—are not neutral explanations but reflect longstanding racial hierarchies of intelligence and worth inherited from colonial and apartheid ideologies (Martin, 2009; Ladson-Billings, 2006). Through the lens of CRT, the

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persistence of teacher blaming can be seen as a subtle continuation of racialised hierarchies of ability, where Black students are unconsciously perceived as less capable of abstract reasoning.

Together, these frameworks provide a multidimensional lens for analysis. Attribution Theory helped identify what kinds of explanations teachers used (e.g., internal vs. external, controllable vs. uncontrollable). At the same time, CRT guided the interpretation of why certain explanations were privileged or normalized in particular social contexts. During data analysis, Attribution Theory informed the initial coding categories for blame attributions, whereas CRT informed the interpretive phase—examining how language, power, and historical meanings shaped those attributions. This combined approach enabled a nuanced understanding of teacher blame as both a psychological coping mechanism and a discourse that sustains systemic inequities in mathematics education. This dual-theoretical combination is novel because few studies have simultaneously applied psychological and sociopolitical lenses to teacher blame. By integrating Attribution Theory and Critical Race Theory, this study bridges individual cognition and structural context, offering a multidimensional understanding of how deficit discourses are produced and sustained in mathematics education.

RESEARCH METHOD

Research design

This study employed a qualitative interpretive design (Creswell, 2007), suited to exploring how teachers construct meaning around student failure in MPS. Data were drawn from a larger project that examined mathematics teaching in post-Apartheid South Africa (Chirinda et al., 2023). The present paper represents a secondary analysis of that dataset, focusing specifically on blame attributions within teacher discourse. Secondary analysis in this context refers to the re-examination of previously collected qualitative data to address new research questionS within the scope of the original project.

The use of secondary analysis was methodologically appropriate because the original dataset contained rich, interview-based narratives directly relevant to the current research questions. Data fit was established by verifying that the interview prompts and teacher responses included explicit references to student difficulty, teaching practices, and problem-solving experiences—themes central to this study. Contextual integrity was maintained through detailed familiarity with the original project's design and analytic memos.

Participants and Sampling

Seven secondary mathematics teachers (three females and four males) from public schools in Gauteng Province participated in the study. They were selected through purposive sampling to represent diversity in teaching experience (ranging from 2 to 20 years) and school contexts (urban township and peri-urban settings). All participants held Bachelor of Education degrees in Mathematics Education and taught classes primarily serving Black learners in multilingual settings.

Data Collection and Ethics

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The dataset comprised semi-structured interviews lasting 45–60 minutes, conducted during school hours and focused on teachers' perceptions of student learning, MPS, and classroom challenges. Ethical clearance for the broader project was granted by the host institution. All participants provided informed consent, and pseudonyms were used to ensure anonymity.

Data Analysis

The analysis used an iterative thematic approach that combined attributional coding and critical discourse analysis, proceeding in three stages:

1. Identification of blame statements: extracting utterances where teachers explained student failure (e.g., *"They just don't want to think through the question")*.
2. Attributional classification: coding statements according to Weiner's (1986) dimensions (internal/external, stable/unstable, controllable/uncontrollable). For example, one statement coded as internal–stable–uncontrollable was *"Some learners are just not maths-minded."*
3. Critical interpretation: interpreting the coded attributions through the lens of Critical Race Theory, identifying how deficit language reflected broader racialised or structural assumptions (e.g., *"These kids want shortcuts" was interpreted as a racialised deficit discourse*).

NVivo software supported systematic coding, while reflective memos helped ensure interpretive transparency.

Credibility and Trustworthiness

Credibility was enhanced through peer debriefing with two colleagues familiar with attributional and discourse analysis. Two independent coders reviewed the coded data and reached consensus on all major themes through iterative discussion, ensuring inter-coder reliability. Reflective memoing during coding was used to monitor researcher bias, and triangulation between Attribution Theory and CRT further strengthened interpretive depth

RESULTS AND DISCUSSION

The analysis of teacher interviews revealed four interrelated themes: (1) effort as moral failure, (2) remediation as proof of weakness, (3) racialised undertones of deficiency, and (4) silencing of teacher responsibility. These themes collectively illuminate how teacher blame operates within the domain of MPS, both as a psychological defense and as a sociocultural discourse. In mathematics classrooms where students are expected to reason, justify, and make sense of unfamiliar problems, attributional beliefs strongly influence whether teachers frame struggle as a sign of learning or as proof of incapacity.

Effort as Moral Failure

Teachers frequently interpreted students 'difficulties in MPS as a moral shortcoming rather than a cognitive or pedagogical challenge. Five of the seven teachers attributed students' problem-solving struggles to a lack of motivation or

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moral discipline. One teacher, Mr. Moses, remarked: "*These learners don't want to think through the question—they give up too quickly."*
Mrs Belinda declared that, *"The learners in my class just don't want to work."*
Ms Sara added, *"If they really wanted to pass, they would practise at home."*
These statements frame effort as a moral trait rather than a teachable skill. In the context of MPS—where persistence, risk-taking, and metacognitive regulation are critical—this moralisation of effort constrains the very dispositions needed for success (Schoenfeld et al., 2023).

Remediation as Proof of Weakness

A second pattern emerged in how teachers discussed remediation. Four teachers regarded revisiting prior content as evidence of students 'incapacity rather than a natural stage in the teaching and problem-solving process. Mr. Peters stated, *"Every year we start Grade 9 with Grade 8 work, but they still can't solve simple equations."*
Mrs Angelo noted, *"We reteach the same basics again and again—it shows they just can't learn maths."*
These quotes show that instead of viewing remediation as scaffolding—an essential part of building problem-solving fluency—teachers interpreted it as repetitive proof of weakness and obscured its diagnostic potential.

Racialised Undertones of Deficiency

Although participants avoided explicit racial references, their discourse often echoed racialised hierarchies of mathematical ability and intellect described in Critical Race Theory (Martin, 2009). Six teachers made implicit references linking mathematical ability to cultural or linguistic background. Ms Sara remarked, "*These kids want shortcuts; they don't think abstractly."*
Mr Adams explained that, *"When I teach problem solving, they just wait for me to show the steps — they don't have that reasoning culture."*
Mrs Angelo added, *"Sometimes they can calculate, but when you ask them to explain, they freeze — they don't have the language for it."*
Though race was not explicitly mentioned, such remarks reflect assumptions about reasoning and language that position certain learners as less capable.

Silencing of Teacher Responsibility

Perhaps the most striking finding was teachers 'silence about their own pedagogical contributions to student failure in MPS. None of the seven teachers considered their own instructional practices—such as task design, clarity, or classroom culture—as possible causes of student difficulty. Instead, students ' deficiencies were treated as the sole cause of difficulty rather than as a signal for reflective pedagogy. As Mrs Angelo noted, "*We explain everything, but some just don't get it."*
Mr Adams remarked, *"They don't concentrate in class; even when I repeat, they're not listening."*
Similarly, Mr Johns stated, *"We finish the syllabus on time, but they don't revise at home — that's not the teacher's fault."*

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Mrs Belinda noted*, "I give them all the notes and examples—if they still fail, what more can I do?"*
Mr Peters concluded, *"Some students just aren't serious about maths; you can teach, but you can't force understanding."*

All teachers described student inattention and lack of revision as the main reasons for poor performance, illustrating a pattern of externalising responsibility for learning, which can be seen as beyond the teacher's control

To enhance transparency and summarise the connection between evidence and interpretation, Table 1 presents each theme alongside representative teacher quotes, attributional classification, and corresponding theoretical interpretation.
Table 1. Summary of Themes, Representative Quotes, and Theoretical Interpretations

Theme	**Representative Quotes**	**Attribution Type (AT)**	**Interpretation (CRT / AT)**
Effort as Moral Failure	"These learners don't want to think through the question—they give up too quickly." "If they really wanted to pass, they would practise at home."	Internal, stable, uncontrollable	Moralising effort frames struggle as character weakness, masking pedagogical or structural factors.
Remediation as Proof of Weakness	"Every year we start Grade 9 with Grade 8 work, but they still can't do it." "We reteach the same basics again and again—it shows they just can't learn maths."	Stable, uncontrollable	Positions remediation as futility; reinforces deficit views of ability and narrows task complexity.
Racialised Undertones of Deficiency	"These kids want shortcuts; they don't think abstractly." "When I teach problem solving, they just wait for me to show the steps—they don't have that reasoning culture."	Internal attributions	Reveals racialised and linguistic deficit discourses that equate abstract reasoning and language proficiency with intelligence.
Silencing of Teacher Responsibility	"We explain everything, but some just don't get it." "I give them all the notes and examples—if they still fail, what more can I do?" "They don't concentrate in class; even when I repeat, they're not listening." "We finish the syllabus on time, but they don't revise at home—that's not the teacher's fault."	External attributions	Demonstrates defensive attribution patterns that externalise responsibility and limit reflective pedagogical change.

Together, these four themes illustrate how teachers' attributions of student failure form a coherent pattern of deficit discourse within mathematical problem solving. Across interviews, teachers consistently interpreted the MPS struggle as

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evidence of personal or moral weakness rather than as a natural part of learning. This orientation reinforced internal, stable, and uncontrollable explanations for underachievement while minimising attention to pedagogical, linguistic, and structural factors. The convergence of these themes shows that teacher blame operates simultaneously as a psychological defence—protecting teachers' sense of efficacy—and as a sociocultural discourse that normalises inequity in mathematics classrooms. By linking individual cognition to broader racialised and structural contexts, these patterns reveal how everyday explanations of failure sustain systemic barriers to equitable participation in MPS.

Discussion

Across all four themes, teachers tended to attribute difficulties in MPS to internal, relatively stable learner characteristics, such as motivation, ability, or effort. This moralisation of effort aligns with Weiner's (1986) attributional dimensions—internal, stable, and uncontrollable, which protect teachers 'self-concept but discourage pedagogical adaptation. When teachers perceive student effort as a fixed moral quality rather than a teachable disposition, they are less likely to scaffold problem-solving heuristics or model strategic thinking. Recent studies confirm that attributing mathematical failure to laziness or low motivation undermines the cultivation of productive struggle (Schoenfeld et al., 2023), which is essential for building conceptual connections (Chirinda, 2021). Conversely, teachers who reframe student persistence as teachable—through guided questioning and reflection—promote agency and resilience (Zhao et al., 2022), which are important attributes of MPS. Thus, moralising effort narrows teachers 'pedagogical repertoire for MPS, replacing curiosity with judgment and empathy with frustration. Instead of positioning students as problem solvers, the discourse of blame positions them as passive recipients of instruction.

Teachers viewed remediation as repetitive failure rather than diagnostic support, reinforcing deficit-based assumptions of low ability. This stance contradicts the growing body of research emphasising the cyclical nature of mathematical understanding, where re-engagement with foundational concepts enables deeper transfer and flexible reasoning (Reddy et al., 2019). In effective MPS instruction, remediation is diagnostic: it identifies missing conceptual links and supports students to connect representations (Kilpatrick et al., 2001). By contrast, teachers in this study described remediation as futile—signalling not students 'evolving understanding but an unchangeable inability. Hoth et al. (2022) observe that such stable attributions of low ability lead teachers to narrow task complexity and avoid open-ended problems. Consequently, students are denied opportunities to engage in authentic MPS, perpetuating a cycle where limited exposure reinforces low performance. Through the lens of CRT, the teachers' utterances reveal how deficit narratives continue to shape MPS contexts in post-apartheid South Africa.

Recent regional studies (Chirinda et al., 2023) confirm that Black students are often positioned as less capable of higher-order reasoning, particularly in non-routine problem tasks. These deficit discourses obscure structural barriers—such as the use of English as the language of instruction, inadequate access to manipulatives, or exam-driven pacing—that constrain mathematical reasoning.

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Language plays a particularly critical role in MPS because it mediates students 'ability to articulate strategies and justify reasoning. When teachers interpret linguistic errors as cognitive deficits, they delegitimise students 'problem-solving strategies and silence alternative mathematical explanations. As Mostert and Roberts (2020) note, linguistic sensitivity in mathematical discourse enables teachers to distinguish between misunderstandings of terminology and conceptual gaps. The absence of such sensitivity in the current study indicates how racialised and linguistic hierarchies persist through everyday classroom talk.

Equally important is the teachers' silence about their own instructional role. By externalising responsibility—blaming students' attitudes or home environments—teachers preserve their sense of competence but limit agency for pedagogical change (Martinko et al., 2006). This defensive attribution pattern, while psychologically protective, restricts reflective practice and reinforces procedural, examination-driven teaching (Shalem & De Clercq, 2019). In contrast, teachers who attribute student difficulty to instructional design or task structure are more likely to adopt inquiry-oriented and adaptive pedagogies that strengthen problem-solving resilience (Zhao et al., 2022). Such reflective attribution enhances not only student engagement but also teacher efficacy. The absence of self-reflection in this study, therefore, represents a missed opportunity for transformative professional learning.

Synthesising across themes, teacher blaming emerges as both a psychological defence and a sociocultural discourse that constrains equitable MPS instruction. Psychologically, it shields teachers from feelings of inadequacy; discursively, it reinforces the belief that mathematical ability is innate rather than developed—a belief that undermines the growth-oriented ethos required for problem-solving proficiency (Chirinda, 2021).

In classrooms dominated by blame, students are less likely to engage in conjecturing, multiple-solution strategies, or collaborative reasoning—key dimensions of mathematical proficiency (Kilpatrick et al., 2001). When failure is moralised, mistakes lose their diagnostic value, and MPS becomes a test of worth rather than a process of sense-making. Conversely, reframing failure as a learning opportunity allows teachers to design tasks within students 'Zones of Proximal Development (Vygotsky, 1978), sustaining cognitive demand while providing scaffolded support.

Across all four themes, teachers consistently framed student failure as stemming from internal limitations rather than instructional or systemic factors. This pattern answers both research questions by showing (a) how blame is linguistically and conceptually constructed, and (b) how such constructions sustain inequitable pedagogical practices. Recognising these attributional patterns provides a foundation for designing professional development interventions that encourage reflective, equity-oriented teaching.

CONCLUSION

This study examined how secondary mathematics teachers in South Africa attribute students' difficulties in MPS to internal factors such as laziness, lack of motivation, or low ability. The findings revealed that these blame-oriented

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attributions function simultaneously as a psychological defence and as a discourse that reproduces structural inequities. The analysis showed that teacher blame narrows instructional possibilities and discourages pedagogical reflection. When teachers interpret struggle as a sign of incapacity, they inadvertently undermine the persistence and reasoning central to MPS. Addressing such attributional patterns requires professional learning that helps teachers reinterpret student struggle as a natural and productive part of mathematical thinking.

Implications for teacher education include integrating structured reflective practices into professional development. Activities such as case-based discussions, video analysis of classroom interactions, and guided dialogue on teacher beliefs can help educators recognise deficit language and reframe student errors as opportunities for pedagogical insight. Attributional retraining workshops may further support teachers in developing adaptive explanations that emphasise strategy use, effort, and instructional design rather than fixed notions of ability.

This study's contribution lies in its dual-theoretical integration of Attribution Theory and Critical Race Theory, offering a multidimensional view of teacher blame as both a cognitive process and a sociocultural discourse. While grounded in South Africa's post-apartheid context, its insights are relevant to other education systems where structural inequalities intersect with teacher belief systems.

Future research could extend this analysis by exploring how targeted professional development influences teachers' attributions over time, or by comparing attributional patterns across cultural and linguistic contexts. Such studies would further illuminate how reflective pedagogies can disrupt deficit discourses and promote more equitable mathematics learning.

Ultimately, transforming the culture of teacher blame requires shifting from explanations of failure to inquiries into learning—seeing struggle not as evidence of incapacity, but as engagement in the deep, uncertain work of making mathematical meaning. Transforming deficit discourse requires teacher education that positions struggle as a site of learning rather than failure.

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