



Mathematical Attribution Patterns and Academic Achievement in Rural South African Secondary Education: A Case Study from the Lady Frere District, Eastern Cape

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Abstract

South African mathematics underperformance is most severe in rural, under-resourced schools, yet how rural learners explain their results is rarely studied. This qualitative case study examined how learners at a rural school in Lady Frere District, Eastern Cape, explain mathematical success and failure. Thirty purposively selected Grade 10-12 learners took part in interviews and focus groups, with eight weeks of classroom observation. Reflexive thematic analysis was followed by deductive mapping of attribution statements onto locus, stability, and controllability. Most learners attributed failure to external, stable, uncontrollable causes; a minority, mostly high achievers, gave effort-based explanations. Five themes shaped these patterns: teaching methods, self-efficacy beliefs, environmental factors, resource accessibility, and cultural and linguistic influences. Because the named causes were verifiably present, the dominant pattern is an accurate diagnosis of structural adversity rather than cognitive distortion. Attribution retraining alone is insufficient where resource scarcity removes the mastery experiences that adaptive attributions require.

Introduction

Mathematics proficiency shapes academic and professional trajectories in ways that affect national economies as much as individual learners, particularly where technical and scientific competencies are in short supply (Kalemile & Katabwa, 2026; Onoshakpokaiye & Avwiri, 2025). Persistent underperformance in mathematics affects educational systems worldwide, especially in developing nations (Theron, 2025; Chand et al., 2021). The Trends in International Mathematics and Science Study (TIMSS) consistently documents large gaps in mathematical achievement across countries, with South African learners frequently performing below international averages (Graham et al., 2024).



In Africa, mathematics education is shaped by historical inequalities, resource constraints, and pedagogical practices that do not always align with learners' cultural and cognitive contexts (Alam & Mohanty, 2023). Educational reforms across the continent have not closed persistent achievement gaps (Agbata et al., 2024; Adeniyi et al., 2024). South Africa illustrates this starkly: despite substantial post-apartheid investment, mathematics performance continues to fall short of national and international benchmarks (Theron, 2025). Spaull and Kotze (2015) show that the achievement gap between South Africa's wealthiest and poorest learners is already fixed by Grade 3 and widens thereafter, so rural and township secondary learners are working from a fundamentally different starting point than their urban peers. Motala and Pampallis (2020) identify the intersection of socioeconomic disadvantage, infrastructural deficiency, and psychological variables, including how learners make sense of their own outcomes, as central to this persistent underperformance.

Research on mathematics underperformance in South Africa has focused predominantly on structural and pedagogical factors, with less attention to how learners explain their own successes and failures. That gap is not a minor omission: attribution patterns shape motivation, persistence, and future academic behaviour independently of the structural conditions that produced them (Weiner, 1985, 2010). A learner who attributes persistent failure to fixed, external, uncontrollable causes will disengage from mathematics more readily than one who attributes failure to effort or strategy. The unresolved question is what happens to that prediction when the external causes are, in fact, real and severe, as in a rural school with too few textbooks, too few qualified teachers, and instruction delivered in a second language. This is the specific problem motivating the present study: rural learners' attributions have rarely been examined in relation to the material conditions that produced them, rather than as a generic instance of a psychological construct.

This paper asks how secondary school learners' attribution patterns for mathematical performance manifest in a rural school in the Lady Frere District, and what contextual factors drive those patterns. Two clarifications follow from the concern that a framework analysis restricts the researcher's ability to see contextual factors that fall outside Western psychological categories of locus, stability and controllability. First, Weiner's three dimensions were used only to classify the structural properties of attributions after they had been inductively generated through reflexive thematic analysis (see Methodology); they did not constrain what learners could say. Second, this paper does not treat Weiner's framework as a neutral instrument applied to a rural school for its own sake. Its contribution is therefore best read as a critique and contextual extension of Weiner's model rather than a straightforward application of it: the structural realities of Lady Frere challenge how the standard framework distinguishes an 'adaptive' from a 'maladaptive' attribution, because an external, stable, uncontrollable attribution is not automatically a distortion when the named cause is verifiably present. This paper argues that many learners' external, stable, and uncontrollable attributions are rational, empirically grounded diagnoses of structural adversity rather than cognitive distortions to be corrected.

Literature Review

This section reviews empirical research on attributions in mathematics education. It moves from international evidence on how learners and teachers explain mathematics performance to the structural,



cultural, and linguistic conditions that shape those explanations in South Africa. The theories used to analyse the data are presented separately in the Theoretical Framework section that follows.

Empirical Evidence in Mathematics Education

Chand et al. (2021) studied secondary learners in Fiji and found that perceived causes of poor performance, including teacher quality, peer influence, and learner attitude, mapped closely onto Weiner's external and internal categories; learners with internal, controllable attributions showed higher motivation to improve than those with external, uncontrollable ones, a finding with cross-cultural implications even though the prominence of particular causes varies by context.

Ocal et al. (2025) show that both pre-service and in-service mathematics teachers hold distinct attribution beliefs for learner success and struggle, often attributing success to effort and failure to ability, a pattern that can reinforce learners' own fixed-ability attributions. The same study found that teacher-held attributions for learner failure significantly influence instructional practice: teachers who attribute underperformance to fixed-ability are less likely to invest in differentiated instruction, reinforcing the very conditions that produce external, uncontrollable attributions among learners, a feedback loop with direct implications for classroom practice.

The South African Context

Within South Africa, mathematical attribution patterns play out against deep systemic inequality. Graven (2014) argues that poverty and inequality, not ability, are the primary explanatory variables for South Africa's mathematics performance profile, and that models imported without adjustment for this material context risk misreading structural disadvantage as psychological deficit. Ngwenya and Chaba (2024) identify interconnected structural, cultural, and policy barriers that make external, stable, uncontrollable attributions the rational default for many learners; rural schools are particularly affected by inadequate facilities, unreliable electricity, and limited access to textbooks and digital tools. Theron (2025) identifies teacher preparedness as a consistent predictor of learner achievement in South Africa, noting that inadequate professional development results in instruction that fails to connect with learners' prior knowledge. This bears directly on attribution formation: learners who consistently fail to understand poorly delivered instruction may rationalise failure as ability-based, or as an inherent property of mathematics, rather than as a consequence of modifiable practice.

The cultural-linguistic environment is both a challenge and a resource. Alam and Mohanty (2023) document how classrooms operating in a language other than learners' home language create attribution-relevant obstacles, making it difficult to distinguish linguistic from mathematical difficulty and leading to external, stable, uncontrollable attributions tied to language. Zhao (2024) adds a cross-cultural dimension, showing that in linguistically diverse classrooms, learners' attribution frameworks are shaped by cultural narratives about mathematical ability and by the language of instruction, findings that apply directly to South African classrooms navigating multilingual dynamics. Motseki et al. (2025) show that ethnomathematics approaches connecting formal concepts to indigenous cultural practices, such as Ndebele art, can make mathematics familiar and personally relevant to learners. In attributional terms, this points to one route by which culturally grounded instruction might weaken language- and relevance-based external attributions.



Theoretical Framework

Two theories frame the analysis. Weiner's (1985) attribution theory supplies the dimensions used to classify learners' causal explanations, and Bandura's (1986, 1997) social cognitive theory explains how those explanations interact with learners' beliefs about their own capability. Each theory is outlined below, followed by the integrated framework and its operationalisation for analysis.

Weiner's Attribution Theory

Bernard Weiner's (1985) attribution theory is the foundational framework for this study. Weiner proposed that when individuals experience success or failure, they construct causal explanations that shape subsequent emotional and motivational responses. The theory identifies four primary causal categories, ability, effort, task difficulty, and luck, organised along three dimensions: locus of causality (internal versus external), stability (stable versus unstable), and controllability (within or beyond the individual's control).

These dimensions carry distinct motivational consequences. Attributions for failure that are internal, stable, and uncontrollable, such as "I am simply not capable of mathematics," are the most damaging, predicting persistent low self-esteem and withdrawal from effort (Weiner, 1985). Attributions that are internal, unstable, and controllable, such as "I did not study enough," are the most adaptive, preserving learner agency. External attributions occur when the external cause is itself stable and uncontrollable, for example, inadequate teaching or resource deprivation; here, the attribution may be accurate and rational rather than maladaptive, which matters especially in low-resource contexts where such barriers genuinely exist.

A related but separate question is whether an external, stable, uncontrollable attribution signals learned helplessness or an accurate appraisal of a hostile environment. Seligman's (1975) account of learned helplessness described a maladaptive generalisation: an organism that stops trying even after the uncontrollable condition has changed. What matters here is not locus, stability, or controllability as such, but whether the named cause is verifiably present and whether the response generalises beyond the situations in which it holds. A learner who names an overcrowded classroom as the reason for failing is diagnosing a real, checkable condition; a learner who concludes that mathematics itself is beyond them, as in "Mathematics dislikes me," has generalised the appraisal into a stable self-characterisation. Both are external in Weiner's terms, but only the second matches learned helplessness. This distinction is used throughout the analysis to separate structurally grounded attributions from their internalised, self-defeating variant.

Self-Efficacy and Its Relationship to Attribution

Self-efficacy and attribution, though mutually reinforcing, are distinct constructs. Bandura (1986, 1997) defines self-efficacy as an individual's belief in their capacity to execute the behaviours required to produce specific outcomes. Attribution, as formulated by Weiner (1985), is the retrospective causal explanation constructed after an outcome has occurred. Low self-efficacy ("I cannot do this") can precede task engagement and depressed effort, while maladaptive attribution ("I failed because I am not a mathematics person") follows failure and shapes future self-efficacy beliefs.



Bandura's (1986) social cognitive theory holds that self-efficacy is built through four sources: mastery experiences, vicarious learning, verbal encouragement, and physiological states. This study retains Bandura alongside Weiner because mastery-experience, the source of self-efficacy most directly foreclosed by resource scarcity, cannot be accumulated by a learner without a textbook, exercise materials, or a functioning feedback loop from a teacher, regardless of their attributional style. Weiner's framework classifies the explanation a learner gives; Bandura's explains why, in this setting, that explanation has almost nowhere adaptive to go. A learner who attributes a rare success to luck will not derive self-efficacy from it the way a learner who attributes it to effort does. The two frameworks are therefore integrated: attribution patterns are the primary unit of analysis (Weiner, 1985), while self-efficacy processes are treated as both a product of, and a contributor to, those patterns (Bandura, 1986, 1997).

Integrated Theoretical Framework

This study synthesises Weiner's (1985) attribution theory with Bandura's (1986) social cognitive theory. Weiner's three dimensions served as the deductive coding scheme applied, in a second analytic stage, to attribution statements first identified inductively (see Methodology). Bandura's framework, particularly its emphasis on the sources of self-efficacy and the reciprocal interaction among environment, behaviour, and cognition, provided interpretive scaffolding for understanding how attribution patterns are maintained and modified within the socioecological conditions of rural South African schooling.

Table I presents the operationalisation of this integrated framework. Each attribution dimension is defined theoretically, connected to Bandura's parallel construct, and translated into the coding criteria applied during analysis.

Table I: Operationalisation of the integrated attribution and self-efficacy framework

Dimension	Weiner's Definition	Bandura's Parallel	Operationalisation in this Study
Locus of Causality	Whether the cause is located within the individual (e.g., ability, effort) or externally (e.g., teacher, resources, luck)	Source of self-efficacy information: internal mastery vs. external modelling	Coded from interview responses: causes attributed to self vs. causes attributed to the school, teacher, environment, or resources
Stability	Whether the cause persists over time (stable) or can change (unstable); stable attributions for failure predict persistent disengagement	Generalised self-efficacy (stable) vs. task-specific confidence (variable)	Stable attributions identified by expressions of permanence (e.g., "always", "never", "just am not") vs. variable attributions (e.g., "when I try harder")
Controllability	Whether the learner can influence the causal factor; uncontrollable causes for failure produce helplessness, controllable causes promote agency	Perceived agency over learning conditions and outcomes	Controllable attributions are identified by references to effort, strategy, or attitude; uncontrollable by references to fixed-ability, structural barriers, or teacher behaviour



Methodology

This section sets out the research design, the research site and participants, the researchers' positionality, the procedures used to collect and analyse data, and the ethical safeguards observed.

Research Design

A qualitative case study design (Yin, 2018) was employed to examine mathematical attribution patterns among learners at a single rural secondary school in the Lady Frere District, Eastern Cape. Yin's logic is used here only at the level of study architecture, to bound the unit of analysis to one school community and to guide triangulation across interviews, focus groups, and observation. It does not govern how the interview and focus group data were coded: that coding followed Braun and Clarke's (2022) reflexive thematic analysis, whose interpretive stance is described below and is not subordinated to Yin's post-positivist case study conventions. A case study was appropriate for developing an in-depth understanding of learners' causal reasoning within the material and cultural conditions of one school community, and a qualitative approach was appropriate for accessing subjective meanings that standardised instruments alone cannot capture (Campbell et al., 2020).

Research Site and Participants

The study was conducted at a rural secondary school in the Lady Frere District, characterised by overcrowded classrooms, limited resources, and a predominantly isiXhosa-speaking learner population instructed in English. From a population of 150 mathematics learners in Grades 10 to 12, 30 participants were selected through purposive sampling (Campbell et al., 2020). The sample was deliberately heterogeneous rather than restricted to failing learners, because the research question concerned how attribution patterns vary, not only how underperformance is explained. Ten learners were selected from each grade, five male and five female, distributed as three high, four average, and three low performers, using the most recent school-reported examination results as the benchmark (high $\geq 70\%$, average 40-69%, low $< 40\%$). This stratification allowed for comparison of attribution patterns across the full performance range, rather than assuming that only struggling learners would produce theoretically interesting explanations. Table II summarises the resulting participant characteristics.

Table 2: Participant characteristics by grade, gender, and performance level

Grade	Male (n)	Female (n)	Total (n)	Performance Level ^a
Grade 10	5	5	10	3 high, 4 average, 3 low
Grade 11	5	5	10	3 high, 4 average, 3 low
Grade 12	5	5	10	3 high, 4 average, 3 low
Total	15	15	30	9 high, 12 average, 9 low

^a Performance bands were defined by school-reported mathematics examination scores: high $\geq 70\%$; average 40-69%; low $< 40\%$.

Researcher Positionality

The lead researchers hold academic affiliations in mathematics and ICT education and have backgrounds in both quantitative and qualitative educational research. This insider knowledge facilitated rapport and sensitivity to the structural conditions of South African schooling, but also introduced a risk of confirmatory interpretation. To mitigate this, reflexive journaling was maintained throughout, peer



debriefing was conducted with colleagues not affiliated with the project, and counter-explanations were actively considered during analysis.

Data Collection

Three complementary data sources were employed, and they were not applied identically or exhaustively to every participant; each served a distinct evidentiary purpose. Individual semi-structured interviews were conducted with all 30 participants, lasting 45 to 60 minutes, and designed to elicit attribution-relevant responses about recent performance, perceived routes to improvement, and the roles of teachers, resources, language, and effort. Questions were piloted with two learners outside the main sample. This interview data forms the primary corpus for the attribution coding reported in the Results.

Three focus group discussions, each comprising the ten learners from one grade, provided a complementary interactional setting in which learners could negotiate their attributional beliefs among peers; these were audio-recorded, transcribed verbatim, and used mainly to check whether attributions expressed privately in interviews held up under peer discussion. Classroom observations were conducted over eight weeks at the level of the class as a whole, not the individual learner, producing field notes on teacher-learner interaction, engagement behaviours, and physical conditions; these were used to check self-reported claims about resources, class size, and instructional practice against what could be directly observed, not to generate an independent attribution profile per learner. Framed this way, the three methods contribute at different evidentiary depths rather than tripling one analytic task across 30 individuals: the interview corpus anchors the coding reported below, while the focus group and observation data serve a corroborating, not a parallel, function.

Data Analysis

Data analysis proceeded in two distinct, sequential stages, and the terminology below is used deliberately to avoid conflating them. First, all interview transcripts, focus group recordings, and observation notes were analysed using Braun and Clarke's (2006, 2022) six-phase reflexive thematic analysis: familiarisation, code generation, theme construction, review, definition and naming, and reporting. This stage was inductive and interpretive; codes were generated from the data itself, without reference to Weiner's categories, and revised across multiple readings. Second, each unit of attribution data identified through that process was mapped deductively onto Weiner's (1985) three dimensions, locus, stability, and controllability, to produce a structural attribution profile. This second stage is a deductive framework-mapping exercise in the tradition of Gale et al. (2013), applied after and separately from the reflexive coding rather than in place of it. Braun and Clarke's (2019, 2022) later work distinguish reflexive thematic analysis from codebook and framework approaches on precisely this axis and allows a reflexive first pass to be followed by a structured, theory-driven second pass, provided the two are not presented as the same procedure. That distinction is honoured here: the themes (Results, Part Two) are the product of the reflexive stage, and the attribution profile (Results, Part One) is the product of the subsequent deductive stage.

Trustworthiness was supported through member checking with six participants, peer debriefing with two independent researchers, triangulation across the three methods, and a detailed audit trail of analytic decisions.



Ethical Considerations

Informed consent was obtained from all participants and, where applicable, from parents or guardians of participants under 18. Participation was voluntary, with an unconditional right to withdraw at any stage. Confidentiality was maintained through participant codes (STU 1, STU 2, etc.) rather than names, and data were stored securely on password-protected devices with encrypted backups. Ethical clearance was granted by the Walter Sisulu University Research Ethics Committee (Ethical Clearance Reference No. ERECQ10-11-2025 (03)) before data collection began. Permission to conduct the study at the school was obtained from the Eastern Cape Department of Education and the school principal.

Results

The findings are presented in two parts. Part One describes the attribution patterns identified across the data, classified according to Weiner's (1985) dimensions through the deductive mapping stage. Part Two presents the five contextual themes that emerged inductively from the reflexive thematic analysis as the principal drivers of those patterns. The two levels are distinct but empirically interconnected: the themes explain why particular attribution patterns predominate in this context.

Attribution Patterns in the Data

Attribution coding of the interview data revealed a clear, consistent pattern: most learners' causal explanations for failure were external in locus, stable over time, and beyond the learner's control. Table III presents a structured summary of the identified attribution types, organised by Weiner's dimensions, with representative quotations.

Table 3: Attribution patterns identified in the data

Locus ^a	Stability	Controllability	Attribution Type	Representative Quote ^b
External	Stable	Uncontrollable	Structural barrier (dominant pattern)	"Mathematics is for those town-based learners." (STU 2)
External	Stable	Uncontrollable	Task difficulty/teacher quality	"Mathematics is difficult, and even when the teacher is teaching it, I find it hard to understand." (STU 16)
External	Variable	Uncontrollable	Teacher effectiveness	"The teacher is lacking here and there, so we end up not understanding him." (STU 6)
External	Stable	Uncontrollable	Resource deprivation	"We do not have access to resources like textbooks and the internet because of data." (STU 20)
External	Stable	Uncontrollable	Cultural/linguistic barrier	"The language used in mathematics is hard to understand." (STU 19)
Internal	Stable	Uncontrollable	Fixed-ability (maladaptive internal)	"Mathematics dislikes me" (STU 1)
Internal	Unstable	Controllable	Effort (adaptive)	"Constant practice and a positive mindset can help me pass Mathematics." (STU 2)
Internal	Unstable	Controllable	Effort/attitude (adaptive)	"I failed Mathematics because I did not study, and my attitude towards the subject caused me to underperform" (STU 4)

^a Attribution dimensions coded from Weiner (1985). ^b STU = individual student participant identifier.

The dominant pattern, external, stable, and uncontrollable, appeared across all three grades and performance bands, most pronounced among low-achieving participants. Learners who held this pattern described failure as caused by fixed factors beyond their influence: teaching quality, the absence of



textbooks and digital resources, classroom conditions, the language of instruction, and mathematics' perceived irrelevance to their lives. Most of these named causes correspond to conditions documented for the research site or recorded in classroom observations, including overcrowding, limited learning resources, and infrequent individual feedback.

A second, much smaller pattern of internal, stable, uncontrollable attributions was also present, exemplified by STU 1's statement that "Mathematics dislikes me." Unlike learners who named a specific, checkable barrier, these learners described failure as a fixed characteristic of the self rather than of their circumstances.

Adaptive attribution patterns (internal, unstable, controllable) were present among a minority, concentrated among high-achieving learners, who attributed both success and failure to modifiable factors such as effort and study strategy. STU 4's observation that "I failed Mathematics because I did not study, and my attitude towards the subject caused me to underperform" preserves the possibility of behavioural change, and STU 2's statement that "constant practice and a positive mindset can help me pass Mathematics" reflects an implicit growth-oriented self-efficacy belief. Interview and observation data suggest these learners were not shielded from the same structural conditions as their peers; rather, they described compensating routines, borrowing a classmate's textbook, arriving early to copy worked examples, or being tutored informally by an older sibling, that gave them intermittent access to mastery experiences.

Contextual Themes Driving Attribution Patterns

Five themes emerged from the reflexive thematic analysis as the contextual conditions behind the attribution patterns described above: teaching methods, self-efficacy beliefs, environmental factors, resource accessibility, and cultural and linguistic influences. Each theme is presented below with supporting evidence from interviews, focus groups, and classroom observation; their interpretation in relation to the literature is taken up in the Discussion.

Theme 1: Teaching methods

Teaching methods were the most prominent theme, appearing in interviews, focus groups, and observations. Learners described instructional practices they experienced as exclusionary or technically ineffective, forming the basis for external, stable, uncontrollable attributions.

A recurring pattern involved differential treatment: STU 4 observed, "The teacher focuses more on those learners who are already good in mathematics and ignores us struggling learners." STU 16 identified a comprehension gap: "Mathematics is difficult, and even when the teacher is teaching it, I find it hard to understand." STU 6 described the same gap differently: "The teacher is lacking here and there, so we end up not understanding him."

Classroom observations corroborated these accounts at the level of teaching practice: formative checks for understanding were rare, and learners who did not volunteer questions, typically the majority, received no individualised feedback. This describes an observed instructional pattern, not a summative judgement of any individual teacher's competence; the protocol recorded the frequency of formative checks and feedback, not a standardised measure of teaching quality, and no claim is made about particular teachers' ability.



Theme 2: Self-efficacy beliefs

Self-efficacy emerged as a theme intersecting with, but conceptually distinct from, attribution, where attribution explains outcomes; self-efficacy concerns prospective beliefs about competence. Learners with maladaptive attribution patterns, particularly the internal, stable, uncontrollable pattern, also displayed depleted self-efficacy, while the minority with effort-based attributions expressed higher self-efficacy even after acknowledging recent failure.

STU 20's statement, "I am too lazy to practice mathematics, I am not good with numbers," mixes two attribution types: "too lazy" is internal, unstable, controllable (effort), while "not good with numbers" is internal, stable, uncontrollable (ability). Their coexistence suggests genuine ambivalence about whether performance is modifiable. STU 1's personalisation of failure, "Mathematics dislikes me," reflects an attribution that began externally but has been internalised as a statement about the self.

STU 2's effort-controllability belief, "constant practice and a positive mindset can help me pass Mathematics," pairs a controllable attribution with confidence that performance can improve. Both belief structures appeared in more than one performance band, although effort-based beliefs were concentrated among high achievers.

Theme 3: Environmental factors

The physical and socioeconomic environment was a consistent source of external, stable, uncontrollable attributions. STU 16 noted overcrowding: "There are so many learners in one small classroom, so the attention is not enough." This account matches the overcrowded conditions described for the research site.

Socioeconomic circumstances beyond the school gate also featured prominently. STU 20 noted that home stress makes it "hard to focus on Mathematics," and observation notes recorded signs of distraction during lessons. STU 2's statement that "Mathematics is for those town-based learners" converts systemic inequality into a belief about intellectual entitlement distributed by place of birth.

Theme 4: Resource accessibility

Limited access to learning materials was a consistent, verifiable source of external, stable, uncontrollable attributions. STU 3 explained: "I usually take my classwork book and see the activities that we did with the teacher, and that is how I learn Mathematics throughout all the years." STU 20 added: "We as learners from rural areas do not have access to resources like textbooks and the internet because of data." STU 17 echoed this: "I always check my previous work on the exercise book and then try to remember what the teacher did in class."

Theme 5: Cultural and linguistic influences

Language of instruction was a significant source of external, stable, uncontrollable attributions, particularly for learners experiencing mathematical difficulty as inseparable from operating in English. STU 19 stated: "The language that is used in mathematics is hard to understand, and there are no resources that are suitable for this subject; in other words, I see it as unrealistic," coupling a linguistic attribution with a task-relevance one, both external, stable, and uncontrollable.

A related pattern concerned perceived cultural irrelevance. STU 17 struggled to see "the importance of the application of mathematics in the future," and STU 3 expressed outright alienation: "Mathematics is



here to make us fail as learners; it is challenging because no one can tell us why we study the subject and what it will be used for in the future.”

Discussion

Weiner’s (1985) framework treats external, stable, and uncontrollable attributions for failure as psychologically damaging, associating them with lower engagement and performance. The central finding of this study is that, in this school, the dominant pattern is empirically grounded rather than distorted. Classroom observation recorded infrequent formative feedback and limited individualised support, consistent with the resource and staffing constraints documented for rural South African schools (Ngwenya & Chaba, 2024; Theron, 2025), though this study did not use a standardised teacher evaluation instrument and makes no claim about individual teachers’ competence. Graven (2014) warns that psychological models imported without adjustment risk misreading structural disadvantage as deficit, and the present data bear that warning out. The causes learners named, including overcrowded classrooms, scarce textbooks, and instruction in a second language, correspond to conditions documented for rural South African schools (Ngwenya & Chaba, 2024), and Spaul and Kotze (2015) show that the resulting achievement gap is established early and persists rather than narrowing. Agbata et al. (2024) report similar urban-rural disparities across Sub-Saharan Africa. Pressures beyond the school gate compound these conditions: the distraction observed among learners who reported home stress is consistent with evidence linking childhood poverty and chronic stress to reduced working memory (Evans & Schamberg, 2009). These are structural facts, not perceived obstacles, and their combination creates an intervention challenge that the South African attribution literature has not adequately addressed.

The teaching-related attributions fit the same reading. Instruction in which failure goes unaddressed produces the repeated failure experiences that Weiner (1985) identifies as the principal source of stable, uncontrollable attributions for inability. Theron (2025) documents inadequate professional development as a systemic feature of South African schooling, and Ocal et al.’s (2025) finding that teachers’ own fixed-ability attributions shape the classroom environment suggests a feedback loop in which teacher and learner attributions reinforce each other.

The internal, stable, uncontrollable pattern is the exception to this reading. Where most learners named a checkable barrier, statements such as “Mathematics dislikes me” generalise repeated failure into a fixed property of the self. This aligns with Seligman’s (1975) concept of learned helplessness rather than with a rational structural diagnosis, and Weiner (1985) predicts that such self-characterisations resist corrective feedback and lead to persistent disengagement. These learners are therefore the group for whom attribution-focused support is most clearly warranted.

Bandura’s (1986) framework explains why the structural pattern is so difficult to shift, and it is here that it adds analytic value beyond what Weiner’s can supply alone. Where learners lack the means for practice-based effort, effort-based attributions, the most adaptive type, cannot take hold: a learner who tried to study but had no materials cannot construct a successful effort-to-outcome chain. Resource scarcity therefore does more than impede learning; it removes the mastery experiences on which adaptive attribution patterns depend (Bandura, 1986, 1997). Repeated failure attributed to stable, uncontrollable causes appears to erode self-efficacy, which reduces effort, produces further failure, and confirms the



original attribution, a cycle most likely where structural barriers make effort investment insufficient for success (Bandura, 1986). The minority with adaptive, effort-based attributions support this interpretation. STU 2's belief in practice and a positive mindset is consistent with Bandura's (1986) controllable outcome expectations, yet these learners were not shielded from the conditions their peers faced. Their agency was not purely dispositional; it depended on workarounds, such as a borrowed textbook, informal tutoring, or early arrival to copy worked examples, for the same resource gaps that produced maladaptive attributions in most peers. They maintained agency by securing narrow, situation-specific access to mastery experiences within structural constraints, not by minimising those constraints.

The cultural and linguistic findings extend this argument. Alam and Mohanty (2023) show how cultural beliefs about mathematical ability circulate in classrooms and shape self-attributions, and Zhao (2024) documents comparable patterns in linguistically diverse classrooms. Learners' descriptions of mathematics as irrelevant, or as designed to make them fail, and STU 2's belief that mathematics is "for those town-based learners" show how systemic inequality can be converted into an attribution about fixed, location-determined aptitude. This is consistent with Tramonte and Willms's (2010) account of how unequal cultural capital produces differences in educational outcomes between advantaged and disadvantaged learners. Ethnomathematics offers one response: Motseki et al. (2025) show that connecting formal concepts to indigenous cultural artefacts can make mathematics culturally familiar. Whether this also moves learners toward internal attributions for difficulty and success was not tested in that work or in the present study, but it is a plausible implication for curriculum design and teacher development in multilingual rural schools.

An intervention that retrains learners to attribute failure to effort rather than to structural barriers or to the psychological dimension alone risks being not only ineffective but also insulting, since it denies the material reality of the conditions under which learners are trying to learn. Effective attribution-aware education must work at both the structural level, teaching quality, resource equity, culturally responsive instruction, and the psychological level, building learners' capacity to use the controllable dimensions of their situation. The adaptive minority described above models the disposition such interventions should cultivate, while the conditions that make it difficult to sustain are addressed.

For educators, professional development should address attribution-aware pedagogy: formative feedback linked to modifiable behaviours, differentiated instruction, and culturally familiar frameworks in formal mathematics teaching. For policymakers, this study shows the inadequacy of psychological intervention without structural change. Equitable resource distribution, manageable class sizes, and multilingual instructional materials are preconditions for attributional interventions; without them, asking learners to attribute failure to effort in an environment where effort is structurally blocked imposes cognitive dissonance rather than building resilience.

Conclusion

The question driving this study was how secondary learners in a rural South African school explain their mathematical successes and failures, and what contextual factors shape those explanations. Most hold external, stable, uncontrollable attributions for failure, structured by five interconnected drivers: teaching methods, self-efficacy beliefs, environmental constraints, resource inaccessibility, and cultural and



linguistic displacement. A minority hold adaptive, effort-based attributions that attribution theory associates with resilience and improvement. Given the structural context, the learners did not distort their situation but accurately perceived a genuinely hostile educational environment and formed causal explanations accordingly. That accuracy is what makes generic attribution retraining insufficient here: psychological retraining cannot substitute for structural reform. Building adaptive attribution patterns under conditions of under-resourcing requires improving those conditions, so effort and strategy can produce the mastery experiences on which adaptive patterns depend.

The integrated Weiner-Bandura framework offers a structured diagnostic tool that moves beyond identifying what learners struggle with toward understanding why they believe they are struggling, with the mastery-experience pathway of self-efficacy serving as the link between resource scarcity and attribution formation. Culturally grounded approaches such as ethnomathematics are one evidence-linked priority for intervention. This study has limitations. It was conducted in a single school with 30 learners, so its findings describe one school community and are not statistically generalisable to rural South African schools as a whole. Attributions were self-reported and captured at one point in time, performance bands relied on school-reported examination results, and classroom observation recorded instructional patterns without a standardised measure of teaching quality. The researchers' own backgrounds may also have shaped interpretation, although reflexive journaling and peer debriefing were used to limit this. Future research should pursue longitudinal studies that track how attribution patterns change in response to pedagogical interventions, and multi-site comparative studies that examine whether patterns differ across school contexts with varying resource profiles.

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