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The Confidence-Competence Paradox in Nigerian Physics Education: A Quantitative Analysis of Efficacy-Achievement Dissociation

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ABSTRACT

This study examines the confidence-competence paradox in Nigerian secondary physics education, where student self-efficacy and academic achievement are systematically decoupled. A quantitative cross-sectional design was employed with a sample of Senior Secondary School (SS2 and SS3) physics students drawn from 12 schools in Delta State, Nigeria ($N = 176$; $M_{age} = 16.2$ years, $SD = 0.9$). The Physics Self-Efficacy Questionnaire (PSE-Q) and a researcher-developed Physics Achievement Test (PAT) served as primary instruments. Pearson correlation analysis revealed a near-zero, statistically non-significant association between efficacy and performance ($r = .046$, $p = .549$), departing markedly from international benchmarks of $r = .33$ to $.52$. Hierarchical multiple regression demonstrated that environmental factors (infrastructure and classroom climate) and instructional practices together accounted for 52.2% of the variance in self-efficacy ($R^2 = .337$ for Block 1; $\Delta R^2 = .185$ for Block 2), yet these same domains accounted for only 15.6% of variance in achievement ($R^2 = .089$ for Block 1; $\Delta R^2 = .067$ for Block 2), and teacher-centered instruction was associated with reduced rather than enhanced performance. No significant sex differences were observed ($p = .599$). The findings are interpreted through a Three-Stage Competence-Translation Model, which extends Social Cognitive Theory to resource-constrained, non-Western educational contexts. Implications for pedagogy, infrastructure investment, and national science education policy in Nigeria are discussed.

Keywords: science self-efficacy; physics achievement; confidence-competence paradox; Social Cognitive Theory; Delta state

INTRODUCTION

The relationship between academic self-efficacy and achievement is a cornerstone of educational psychology. Meta-analytic evidence consistently demonstrates that domain-specific self-beliefs predict performance with substantial effect sizes (Honicke & Broadbent, 2016; Talsma et al., 2018). In science education specifically, these beliefs function as primary drivers of persistence and science, technology, engineering, and mathematics (STEM) career trajectories (Marshman et al., 2018; Bakdoolot & Dangin, 2024). However, the present study of secondary physics students in Delta State, Nigeria, identifies a confidence-competence paradox: students demonstrate moderate self-efficacy ($M = 55.09$ out of a possible 125), yet this confidence shares no statistically meaningful relationship with actual achievement ($r = .046$, $p = .549$).

This dissociation constitutes a systemic translation problem rather than a motivational deficit. Hierarchical multiple regression reveals that environmental factors (infrastructure and resources) and instructional practices jointly account for 52.2% of the variance in student self-efficacy, but only 15.6% of the variance in achievement. In resource-constrained settings, these factors appear to function as structural bottlenecks in which efficacy becomes calibrated to rote memorization and fails to support success on conceptually demanding assessment tasks. Consequently, traditional confidence-boosting interventions may be insufficient to improve outcomes.

While prior studies conducted in Nigerian and broader African contexts have documented low physics achievement among secondary students (Ogunleye, 2019; Okokon et al., 2023), the specific mechanism of efficacy-achievement decoupling as a structural translation problem remains underexplored. Most existing studies in sub-Saharan Africa either focus on motivational or attitudinal variables in isolation or examine achievement without attending to the calibration of self-belief. The present study addresses this gap by jointly measuring self-efficacy, achievement, and the environmental and instructional conditions that may moderate their relationship.

This paper argues that bridging the efficacy-achievement gap requires a dual approach: sustaining student self-efficacy while concurrently reforming the pedagogical and environmental conditions through which latent confidence can be converted into measurable proficiency. In doing so, the study extends Social Cognitive Theory (SCT; Bandura, 1997) by illustrating how contextual constraints may moderate the efficacy-achievement nexus in non-Western, resource-limited settings, and proposes a Three-Stage Competence-Translation Model to guide theory and practice.

Research Questions

The study was guided by the following research questions:

1. What is the relationship between physics self-efficacy and academic achievement among Senior Secondary School students in Delta State, Nigeria?
2. To what extent do environmental and instructional factors predict physics self-efficacy among these students?
3. To what extent do environmental and instructional factors predict physics achievement?
4. Are there significant sex differences in physics self-efficacy and academic achievement?

Theoretical Framework

Social Cognitive Theory and Contextual Calibration

The confidence-competence paradox is best understood through a synthesis of SCT (Bandura, 1997) and situated learning theory. SCT posits that self-efficacy facilitates achievement by moderating task selection, persistence, and metacognitive engagement: pathways that underpin the robust correlations observed in global meta-analyses (Honicke & Broadbent, 2016). Bandura (1997) further asserts that efficacy is prospective and context-dependent, shaped primarily by four sources: mastery experience, vicarious learning, verbal persuasion, and physiological states.

In the resource-constrained classrooms of Delta State, students calibrate their confidence against rote-based benchmarks such as formulaic recall, the most accessible source of mastery experience available to them. The paradox emerges when assessments transition to conceptual application: efficacy nurtured through passive, teacher-centered instruction becomes uncoupled from the rigorous cognitive demands of scientific inquiry. Consequently, high student confidence may signify mastery of procedural recall rather than the conceptual proficiency required for physics achievement.

Positioning the Three-Stage Competence-Translation Model

The proposed Three-Stage Competence-Translation Model (CTM) builds upon, but is distinct from, two prominent frameworks: Zimmerman's (2000) cyclical self-regulation model and Eccles and Wigfield's Expectancy-Value Theory (EVT; Eccles et al., 1983). Zimmerman's model posits a feedback loop among forethought, performance, and self-reflection phases, in which self-efficacy is continuously recalibrated through outcome experience. While this cycle is theoretically sound in contexts where instructional feedback is rich and task demands are authentically aligned with assessment, it assumes access to genuine mastery experiences. In resource-constrained classrooms where laboratory work is absent and teacher-centered rote instruction predominates, the self-reflection phase of Zimmerman's cycle receives distorted feedback: students interpret procedural success as evidence of conceptual mastery, producing a miscalibrated efficacy signal.

EVT similarly predicts that expectancy beliefs (a construct closely related to self-efficacy) and task value jointly determine achievement-related behaviour. However, EVT does not specifically account for environments in which high expectancy beliefs co-exist with structurally constrained pathways to competence. Students in this study may hold positive expectancy beliefs precisely because the low-demand instructional environment renders academic tasks appear manageable, yet this expectancy bears no functional relationship to performance on higher-order assessment items. The CTM thus extends both frameworks by foregrounding the structural translation conditions that determine whether high efficacy produces genuine competence or merely reinforces illusory confidence.

The Three-Stage Competence-Translation Model

Drawing on SCT and the present empirical findings, this study proposes a Three-Stage Competence-Translation Model to conceptualize the dissociation between self-belief and academic performance:

1. Efficacy Development. Students acquire mastery experiences from lower-order classroom successes, resulting in moderate self-efficacy (M = 55.09/125) that is misaligned with higher-order cognitive demands.

2. Behavioural Engagement. High confidence sustains effort and persistence (Schunk & DiBenedetto, 2020); however, the near-zero correlation (r = .046) indicates that this effort is channelled into superficial or procedurally limited learning strategies.

3. Competence Translation. This stage constitutes the structural bottleneck. In resource-poor environments, the absence of laboratory infrastructure and scaffolded inquiry appears to prevent behavioural effort from crystallising into conceptual competence.

The confidence-competence paradox is thus best characterized as a translation problem rather than a motivational one. Efficacy calibrated to passive pedagogy becomes functionally limited when tested against tasks requiring empirical scientific reasoning, suggesting the need for a shift toward authentic instructional practices.

METHOD

Research Design

A quantitative analytic correlational survey design was employed. This approach is appropriate for investigating concurrent relationships among self-efficacy, achievement, and contextual variables in a naturalistic school setting without researcher-imposed manipulation (Creswell & Creswell, 2018).

Participants and Sampling

Participants were SS2 and SS3 physics students drawn from 12 public and private secondary schools in Delta State, Nigeria. A stratified random sampling procedure was used, with schools stratified by local government area and then randomly selected within each stratum to ensure geographic representation across the state. Within each selected school, intact physics classes were identified and all consenting students in those classes were included in the study.

The final analytical sample comprised N = 176 students (n = 107 males, n = 69 females; M_{age} = 16.2 years, SD = 0.9). Data were collected during the first term of the 2025/2026 academic session. Ethical clearance was obtained from the Delta State Ministry of Education, and informed consent was secured from school principals and, where applicable, parents or guardians. Student participation was voluntary and anonymous.

Instrumentation

Physics Self-Efficacy Questionnaire (PSE-Q)

Self-efficacy was measured using the Physics Self-Efficacy Questionnaire (PSE-Q), a 25-item instrument rated on a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), yielding a total score ranging from 25 to 125, with higher scores indicating greater self-efficacy. Items assess students' confidence in performing physics-related tasks spanning conceptual understanding, problem-solving, and laboratory work. The instrument was adapted from the PSE-Q originally developed by Lindstrom and Sharma (2011) and piloted on a separate sample of 50 students not included in the main study. Internal consistency for the pilot and main samples was satisfactory, with Cronbach's alpha coefficients ranging from .78 to .92 across subscales.

Physics Achievement Test (PAT)

Achievement was assessed using the researcher-developed Physics Achievement Test (PAT), a 50-item multiple-choice instrument aligned with the SS2 and SS3 physics curriculum as specified by the Nigerian Educational Research and Development Council (NERDC). Items were constructed at varying cognitive levels following Bloom's revised taxonomy, with approximately 40% targeting recall and comprehension and 60% targeting application, analysis, and evaluation. The instrument was validated by a panel of three physics education experts and two Educational Measurement and Evaluation specialists. A pilot administration was conducted to establish item difficulty and discrimination indices. The Kuder-Richardson Formula 20 (KR-20) reliability coefficient for the PAT was .74, indicating acceptable internal consistency for a dichotomously scored achievement test.

Questionnaire on Instructional Practices and Environmental Factors (QIPEF)

The contextual predictors were assessed using the researcher-developed Questionnaire on Instructional Practices and Environmental Factors (QIPEF), a 25-item instrument comprising two major domains and four subscales. The Environmental Domain includes: (a) Infrastructure and Resources (8 items; e.g., access to laboratory equipment and teaching aids; Cronbach's $\alpha = .81$), and (b) Classroom Climate (7 items; e.g., perceived learning environment quality and peer support; $\alpha = .77$). The Instructional Domain includes: (c) Teacher-Centered Practices (5 items; e.g., frequency of lecture-only delivery and didactic testing; $\alpha = .79$), and (d) Pedagogical Variety (5 items; e.g., use of demonstration, cooperative, and problem-solving methods; $\alpha = .76$). Each item is rated on a five-point Likert scale. Subscale scores were computed as the mean of constituent items, and composite domain scores were used in regression analyses. The QIPEF was piloted on 30 students not included in the main study, and items with item-total correlations below .30 were revised.

Data Analysis

All analyses were performed using IBM SPSS Statistics Version 23. Descriptive statistics (means, standard deviations, ranges) were computed for all primary variables. A Pearson product-moment correlation coefficient was calculated to assess the bivariate relationship between PSE-Q scores and PAT scores. Two parallel hierarchical multiple regression analyses were conducted: one predicting self-efficacy (PSE-Q) and one predicting achievement (PAT). In both models, Environmental Domain predictors (Infrastructure/Resources and Classroom Climate subscales) were entered in Block 1, and Instructional Domain predictors (Teacher-Centered Practices and Pedagogical Variety subscales) were added in Block 2. A rank-discordance analysis was conducted to supplement the correlation analysis: participants were classified as rank-discordant if their standardized PSE-Q score and standardized PAT score carried opposite signs (i.e., above the mean on one measure while below the mean on the other). An independent-samples t-test examined sex differences in both PSE-Q and PAT scores. The significance threshold was set at $\alpha = .05$ for all inferential tests.

RESULTS

Descriptive Statistics

Table 1 presents descriptive statistics for the primary study variables. Students demonstrated moderate physics self-efficacy overall ($M = 55.09$, $SD = 12.34$, out of a possible 125). Mean achievement scores were nearly identical across efficacy strata: students in the highest self-efficacy quartile (PSE-Q ≥ 62) achieved a mean of 48.3% on the PAT ($SD = 17.9$), compared with 46.8% for those in the lowest quartile (PSE-Q ≤ 49; $SD = 18.7$). An independent-samples t-test confirmed that this 1.5 percentage-point difference was trivial and non-significant, $t(86) = 0.67$, $p = .500$.

Table 1 Descriptive Statistics for Physics Self-Efficacy and Achievement Variables

Variable	***N***	***Mean***	***SD***
Physics Self-Efficacy (PSE-Q, /125)	176	55.09	12.34
Physics Achievement (PAT, %)	176	48.67	18.42
High-Efficacy Quartile (PSE-Q ≥ 62)	44	48.3	17.9
Low-Efficacy Quartile (PSE-Q ≤ 49)	44	46.8	18.7

Note. PSE-Q = Physics Self-Efficacy Questionnaire (scored 25 to 125). PAT = Physics Achievement Test expressed as a percentage. High- and Low-Efficacy Quartile rows present PAT descriptive statistics for each subgroup.

Correlation Analysis

The Pearson correlation between PSE-Q total scores and PAT scores was r = .046, p = .549 (Table 2), indicating a near-zero and statistically non-significant association. This finding represents a marked departure from the r = .33 to .52 range consistently reported in international meta-analytic research (Honicke & Broadbent, 2016; Bakdoolot & Dangin, 2024). A rank-discordance analysis revealed that approximately 49% of participants (n = 86) held a standardized score above the sample mean on one measure while falling below the mean on the other, confirming that self-efficacy scores in this context carry negligible predictive weight relative to international norms.

Table 2 Pearson Correlations Between Physics Self-Efficacy and Achievement

Variable	***1***	***2***
1. Physics Self-Efficacy (PSE-Q)	—	
2. Physics Achievement (PAT)	.046	—

Note. N = 176. The correlation between variables 1 and 2 is non-significant (p = .549, two-tailed).

Hierarchical Regression Analyses

Table 3 presents hierarchical regression results predicting physics self-efficacy. Block 1 introduced Environmental Domain predictors, which together accounted for 33.7% of the variance in PSE-Q scores, $F(2, 173) = 44.00$, $p < .001$, $R^2 = .337$. Infrastructure and Resources emerged as a significant predictor ($\beta = .412$, $p < .001$), as did Classroom Climate ($\beta = .289$, $p < .001$). The addition of Instructional Domain predictors in Block 2 produced a statistically significant increment, $\Delta R^2 = .185$, $\Delta F(2, 171) = 33.10$, $p < .001$, bringing total explained variance to 52.2%. Teacher-Centered Practices was the strongest single predictor ($\beta = .499$, $p < .001$), followed by Pedagogical Variety ($\beta = .212$, $p < .001$).

Table 4 presents parallel hierarchical regression results predicting physics achievement (PAT). Environmental Domain predictors in Block 1 accounted for only 8.9% of PAT variance, $F(2, 173) = 8.44$, $p < .001$, $R^2 = .089$. The addition of Instructional Domain predictors in Block 2 produced a modest increment, $\Delta R^2 = .067$, $\Delta F(2, 171) = 6.77$, $p = .001$, for a total of 15.6% explained variance. Critically, Teacher-Centered Practices was a significant negative predictor of achievement ($\beta = -.214$, $p = .010$), meaning that greater exposure to didactic instruction was associated with lower PAT scores even as it was associated with higher self-efficacy. Pedagogical Variety was a positive predictor of achievement ($\beta = .186$, $p = .032$). Together, Tables 3 and 4 illuminate the structural character of the paradox: the same instructional environment that elevates student confidence appears to suppress conceptual competence.

Table 3 Hierarchical Regression Analysis Predicting Physics Self-Efficacy (PSE-Q)

Predictor	***B***	***SE***	***Β***	***t***	***p***	***R² / ΔR²***
Block 1: Environmental Factors						$R^2 = .337$; $F(2, 173) = 44.00$
Infrastructure/Resources	.73	.08	.412	9.13	< .001	
Classroom Climate	.62	.10	.289	6.20	< .001	
Block 2: + Instructional Factors						$\Delta R^2 = .185$; $\Delta F(2, 171) = 33.10$
Teacher-Centered Practices	1.62	.18	.499	9.00	< .001	
Pedagogical Variety	.62	.15	.212	4.13	< .001	Total $R^2 = .522$

Note. N = 176. B = unstandardized coefficient; SE = standard error; β = standardized coefficient. p < .001 for all block F-tests.

Table 4 Hierarchical Regression Analysis Predicting Physics Achievement (PAT)

Predictor	***B***	***SE***	***β***	***t***	***P***	***R² / ΔR²***
Block 1: Environmental Factors						$R^2 = .089$; $F(2, 173) = 8.44$
Infrastructure/Resources	.52	.22	.198	2.36	.019	
Classroom Climate	.59	.27	.187	2.19	.030	
Block 2: + Instructional Factors						$\Delta R^2 = .067$; $\Delta F(2, 171) = 6.77$
Teacher-Centered Practices	−1.04	.40	−.214	−2.60	.010	
Pedagogical Variety	.82	.38	.186	2.16	.032	Total $R^2 = .156$

Note. N = 176. B = unstandardized coefficient; SE = standard error; β = standardized coefficient. A negative β for Teacher-Centered Practices indicates that greater reliance on didactic instruction is associated with lower achievement scores.

Sex Differences

Independent-samples t-tests revealed no statistically significant differences between male and female students on either the PSE-Q or the PAT (p = .599). This finding suggests that the confidence-competence paradox operates with comparable force across both sexes within this context, and that sex-differentiated psychological interventions are unlikely to address the structural origins of the dissociation.

DISCUSSION

The Efficacy-Achievement Dissociation

The central finding of this study, a near-zero correlation between physics self-efficacy and academic achievement (r = .046) among secondary students in Delta State, constitutes a significant departure from international educational psychology benchmarks in the range of r = .33 to .52 (Honicke & Broadbent, 2016; Multon et al., 1991). The rank-discordance rate of approximately 49% confirms that self-efficacy scores carry negligible predictive value for achievement in this sample and points toward a contextually grounded phenomenon rather than a measurement artefact.

This pattern is consistent with Bandura's (1997) observation that efficacy is prospective and calibrated to the feedback environment available to the learner. In Delta State classrooms dominated by rote instruction and limited assessment diversity, the predominant source of mastery experience appears to be successful recall of formulaic knowledge. Students who excel at procedural memorization develop genuine confidence, but that confidence may be misaligned with the conceptual reasoning demanded by physics assessments. The result is a population of students who are simultaneously confident and underperforming, not because motivation is absent but because the pedagogical infrastructure through which confidence should convert to competence is constrained.

Environmental and Instructional Determinants

The hierarchical regression results illuminate the structural character of this paradox and reveal a critical asymmetry. Environmental factors explained 33.7% of self-efficacy variance but only 8.9% of achievement variance. This asymmetry is consistent with the CTM: the same environmental conditions that shape what students feel capable of doing do not straightforwardly enable them to do it. The widespread absence of functional laboratory facilities in Nigerian secondary schools, documented across multiple periods in the literature (Danjuma & Adeleye, 2015; Bawan et al., 2024), deprives students of the hands-on mastery experiences that Bandura's model identifies as the most powerful calibration source. Yahaya and Akanbi (2023) confirm that students in Nigerian post-basic schools frequently lack both access to and familiarity with standard physics laboratory apparatus.

The divergent direction of the Teacher-Centered Practices predictor across the two regression models is the sharpest evidence of the paradox's structural nature. Greater reliance on didactic instruction was associated with higher self-efficacy ($\beta = .499$) but lower achievement ($\beta = -.214$), suggesting that teacher-centered methods produce illusory rather than genuine confidence. Students exposed primarily to expository teaching may develop confidence in performing the surface-level tasks that such methods reward, while remaining ill-equipped for the conceptual demands of standardized assessments. Deslauriers et al. (2011) demonstrated that structured active learning significantly outperforms traditional lecturing on conceptual physics measures, reinforcing the view that instructional design is the proximal driver of achievement in this context.

From Motivation to Translation

A recurrent policy response to low physics achievement in sub-Saharan African contexts has been to attribute underperformance to motivational deficits and to prescribe confidence-building interventions. The present findings challenge this framing. High-efficacy students in this sample did not outperform their low-efficacy peers to any meaningful degree, demonstrating that the identified problem involves a shortage of the structural conditions through which motivated effort can produce learning rather than a shortage of motivation itself.

This characterization aligns with Yeager and Walton's (2011) caution against treating social-psychological interventions as universal remedies. While growth mindset messaging and attributional retraining (Blackwell et al., 2007) may reframe academic difficulty in productive ways, they cannot substitute for the laboratory infrastructure and inquiry-based pedagogy that enable effort to produce genuine conceptual understanding. The CTM locates the critical intervention point at Stage 3: the structural conditions that govern whether behavioural engagement translates into competence.

Policy Implications and Future Research

Intervention Framework and Policy Recommendations

The Three-Stage CTM implies a tripartite strategy in which sustainable improvement requires simultaneous attention to environmental enhancement, instructional transformation, and efficacy recalibration. These components are interdependent: gains in one domain without corresponding attention to the others are likely to produce incomplete or short-lived effects.

Infrastructure investment represents the foundational prerequisite. Functional laboratory access is not a pedagogical supplement; it is a precondition for the mastery experiences through which self-efficacy can become productively calibrated. Where capital-intensive construction is not immediately feasible, frugal innovation strategies deploying low-cost, locally sourced apparatus have been shown to produce meaningful conceptual gains (Yahaya & Akanbi, 2023). Virtual laboratory environments represent a complementary option (Zivanayi, 2025). State and federal budget allocations should systematically prioritize laboratory equipping alongside classroom infrastructure.

Instructional transformation is the highest-leverage and most immediately implementable intervention, as it is within teacher control and requires no capital expenditure. The 5E Instructional Model (Engage, Explore, Explain, Elaborate, Evaluate) and peer-instruction protocols offer evidence-based frameworks for this transition. Freeman et al. (2014) established through meta-analysis that active learning significantly improves STEM performance, particularly for conceptual reasoning outcomes. Within Nigeria, Agboghoroma et al. (2022) demonstrated that hierarchically scaffolded instructional approaches using Gagné's conditions of learning simultaneously elevated achievement and self-belief. Policy should require a minimum of 40 annual hours of continuing professional development for physics teachers focused on student-centred and inquiry-based models aligned with NERDC curriculum standards. To address the qualified teacher shortage, implementation should include intensive content-pedagogy integration training and structured peer-coaching.

Efficacy recalibration addresses the third stage of the CTM by aligning student self-belief with authentic capability. Calibrated feedback systems incorporating process-focused assessment and growth mindset messaging (Blackwell et al., 2007) can reframe academic difficulty as a prerequisite for mastery. National and school-based assessment protocols should incorporate conceptual inventories and performance-based tasks that enable students to self-assess against authentic scientific reasoning standards, reducing the miscalibration that rote-based examination exclusively fosters.

A phased implementation is recommended to prevent systemic overload. Phase 1 (months 1 to 3) should prioritize pedagogical reform. Phase 2 (months 3 to 9) addresses infrastructural enhancement through low-cost laboratory equipping and resource-sharing initiatives. Phase 3 (month 9 onward) focuses on scaling successful pilots into national and state curricula and establishing monitoring systems to track efficacy-achievement alignment over time.

Limitations and Directions for Future Research

Several limitations constrain the generalizability of the present findings. First, the cross-sectional design precludes causal inference: longitudinal research is required to track the developmental trajectory of the efficacy-achievement relationship across students' secondary school careers. The causal language of 'structural bottleneck' used throughout this paper is intended to describe a hypothesized mechanism consistent with the data pattern, not to assert causation established by correlational analysis.

Second, the study is geographically bounded to Delta State; replication across diverse ecological and socioeconomic contexts within Nigeria and across sub-Saharan Africa is essential to establish the broader prevalence of the paradox. Third, the PSE-Q and PAT are quantitative instruments that cannot capture the nuanced cognitive structures underlying student misconceptions; future studies should complement these measures with think-aloud protocols, physics concept inventories (e.g., the Force Concept Inventory), and qualitative classroom observation. Fourth, and most critically for policy, randomized controlled trials are required to test the causal efficacy of the proposed tripartite intervention framework before it is adopted at scale.

CONCLUSION

This study has identified and empirically characterized a confidence-competence paradox in Nigerian secondary physics education: students in Delta State demonstrate moderate self-efficacy that shares no statistically meaningful relationship with their academic achievement. Analysis reveals that this phenomenon is associated with structural translation conditions rather than motivational deficits. Environmental barriers and teacher-centered instructional practices appear to prevent efficacy-driven effort from yielding conceptual competence, and these conditions operate with comparable force regardless of student sex.

The Three-Stage Competence-Translation Model proposed here provides a theoretically grounded framework for understanding how contextual constraints may moderate the efficacy-achievement nexus in non-Western educational settings, extending Social Cognitive Theory beyond the conditions under which it was originally validated and differentiating the structural translation problem from the motivational accounts offered by Zimmerman's self-regulation model and Expectancy-Value Theory.

Psychological interventions targeting confidence in isolation are insufficient where structural bottlenecks persist. By adopting the tripartite strategy recommended here, progressing from instructional restructuring through environmental enhancement to efficacy recalibration, Nigerian education stakeholders have an evidence-informed pathway toward closing the physics achievement gap. Doing so is not merely an educational imperative; it is a prerequisite for cultivating the technically proficient workforce required to sustain national economic development.

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