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AGRICULTURAL TEACHER EDUCATOR BURNOUT, INSTRUCTIONAL QUALITY, AND STUDENTS' LEARNING OUTCOMES IN COLLEGES OF EDUCATION IN NORTH-WEST NIGERIA: A MULTILEVEL MEDIATION STUDY

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Abstract

The quality of agricultural teacher education in North-West Nigeria is compromised by an inadequately documented occupational burnout crisis among teacher educators that erodes instructional quality and cascades into diminished student agricultural knowledge outcomes. This study determined the relationships among agricultural teacher educator burnout, perceived instructional quality, and student agricultural knowledge attainment across twelve colleges of education in North-West Nigeria. A cross-sectional multilevel mediation design was employed. 108 agricultural teacher educators and 648 of their NCE III students participated. Three validated instruments measured educator burnout, instructional quality, and student agricultural knowledge. Multilevel modelling with Level-1 (student) and Level-2 (educator) data structures was employed, alongside PROCESS macro bootstrapped mediation analysis at the

educator level. The study found that burnout correlated negatively with instructional quality, $r(106) = -.67$, $p < .001$. Instructional quality significantly mediated 58.4% of the total burnout-to-student-knowledge effect (indirect effect = -0.34 , 95% BCa CI $[-0.44, -0.25]$). Emotional exhaustion was the burnout dimension most strongly associated with reduced instructional quality ($\beta = -.51$). Workload, collegial support deficits, and salary inadequacy were the highest-rated burnout antecedents. Institutional welfare reforms and structured collegial support systems are recommended as the primary intervention mechanisms to reverse the burnout-driven deficit in instructional quality in North-West Nigerian agricultural teacher education.

Keywords: Teacher educator burnout; instructional quality; agricultural teacher education; student learning outcomes; multilevel mediation.

Introduction

The quality of agricultural teacher education constitutes one of the most consequential and

least examined determinants of the agricultural science knowledge base that graduates of Nigerian colleges of education carry into secondary school classrooms

across the country. Colleges of education in North-West Nigeria accredited by the National Commission for Colleges of Education (NCCE) to produce Nigeria Certificate in Education (NCE) holders who will teach agricultural science at junior and senior secondary school levels—annually graduate thousands of agricultural science teachers who will shape the agronomic understanding, vocational aspiration, and environmental stewardship orientation of millions of secondary school students in Sokoto, Kebbi, Zamfara, Kano, Katsina, Kaduna, and Jigawa States over multi-decade careers (National Commission for Colleges of Education [NCCE], 2022; National Bureau of Statistics [NBS], 2023). The quality of instruction that teacher educators receive during their NCE programme is therefore a high-leverage input into Nigeria's agricultural education system, one that multiplies its effect through every career-long interaction between a trained teacher and their students.

A growing body of professional welfare research in Nigerian tertiary education documents a deepening occupational burnout crisis among teaching staff in colleges of education and universities, driven by the intersection of chronically excessive workloads, inadequate and irregular salary payments, deteriorating physical infrastructure, absence of professional

development opportunities, weak collegial and administrative support structures, and the cascading psychological demands of teaching in resource-depleted and socially disrupted environments (Adewale, Obinne, & Ihejirika, 2021; Oluwole & Fasakin, 2022). Occupational burnout, conceptualised by Maslach, Schaufeli, and Leiter (2021) as a syndrome of emotional exhaustion, depersonalisation of service recipients, and reduced sense of personal accomplishment arising from chronic workplace stress, is particularly likely to manifest in educational settings where the affective and cognitive demands of teaching are high but institutional support for meeting those demands is systematically inadequate.

The pathway from teacher educator burnout to student learning outcomes is theoretically mediated by instructional quality, the degree to which lesson planning, content delivery, student engagement facilitation, assessment design, and feedback provision are executed at levels that maximise student knowledge acquisition and skill development. A burned-out educator who experiences emotional exhaustion cannot sustain the motivational investment required for lesson innovation; one experiencing depersonalization gradually reduces the interpersonal responsiveness and enthusiasm that make content accessible and memorable for students; and one experiencing reduced

personal accomplishment progressively withdraws the discretionary effort that distinguishes merely adequate from genuinely excellent teaching (Hakanen, Bakker, & Schaufeli, 2021; Skaalvik & Skaalvik, 2021). The resulting degradation in instructional quality translates into measurable student knowledge deficits and a mediated burnout cascade that has been documented in European and East Asian teacher burnout literatures but has not been empirically characterised in Nigerian agricultural teacher education contexts.

The North-West Nigerian College of Education context is particularly urgent for this investigation. The zone hosts the highest concentration of agricultural colleges of education in Nigeria relative to its land area, serves farming communities whose livelihoods depend disproportionately on the quality of agricultural knowledge transfer through the school system, and has been identified by NCCE accreditation reports as among the most resource-stressed college zones in the country, with documented deficiencies in laboratory equipment, agricultural land and practical farms, library holdings, and staff welfare provisions (NCCE, 2022). These structural conditions are precisely those that burnout research identifies as most likely to accelerate the burnout syndrome and most consequential in their effects on instructional quality. Yet no

multi-institution empirical study has tested the full burnout-quality-outcomes mediation chain in this context.

Objectives of the Study

The study was designed to:

1. characterise the prevalence and dimensional profile of occupational burnout among agricultural teacher educators in North-West Nigerian colleges of education.
2. assess the perceived instructional quality of agricultural teacher educators across the participating institutions.
3. determine the relationship between educator burnout and perceived instructional quality.
4. establish whether instructional quality mediates the relationship between educator burnout and student agricultural knowledge attainment.
5. Identify the institutional antecedents of burnout that educators rate as most severe.

Research Hypotheses

The following null hypotheses were tested at $\alpha = .05$:

1. There is no significant relationship between agricultural teacher educator

burnout and perceived instructional quality in North-West Nigerian colleges of education.

2. Educator burnout does not significantly predict student agricultural knowledge attainment after controlling for educator experience and institutional characteristics.
3. Perceived instructional quality does not significantly mediate the relationship between educator burnout and student agricultural knowledge attainment.
4. The three burnout dimensions (emotional exhaustion, depersonalization, and reduced personal accomplishment) do not differentially predict instructional quality outcomes.

Review of Literature

Maslach et al.'s (2021) tripartite burnout model remains the most widely validated framework for conceptualizing occupational burnout in educational settings. The model identifies three interdependent but analytically separable burnout dimensions. Emotional exhaustion describes the depletion of emotional resources from sustained high-demand interpersonal engagement, the feeling of being emotionally spent and incapable of the affective

investment that authentic teaching requires. Depersonalisation describes the development of cynical, detached, or callous attitudes toward students and colleagues, a psychological distancing strategy that reduces the immediate emotional drain of teaching engagement at the cost of the relational quality that makes teaching effective. Reduced personal accomplishment describes the erosion of professional efficacy beliefs—the sense that one's teaching efforts are not producing meaningful student growth—which progressively undermines the motivational investment that instructional quality requires (Hakanen et al., 2021; Maslach et al., 2021).

The distinctive occupational structure of college of education teaching creates a specific burnout vulnerability profile. Agricultural teacher educators at North-West Nigerian colleges simultaneously manage heavy teaching loads, supervise student teaching practicums, coordinate agricultural practical farms, participate in community service activities, and manage the administrative demands of NCCE accreditation compliance all within an institutional environment of chronic resource insufficiency and salary irregularity (NCCE, 2022; Oluwole & Fasakin, 2022). This combination of high demand, low resource, and weak administrative support is precisely the demand-resource imbalance that

Conservation of Resources Theory (Hobfoll, 2022) identifies as the structural driver of burnout progression.

This study is grounded in two complementary theoretical frameworks. The Job Demands-Resources (JD-R) Model (Bakker & Demerouti, 2021) provides the primary framework for burnout aetiology. The JD-R model proposes that burnout develops when job demands—physical, psychological, social, or organisational aspects of a job that require sustained effort and are associated with physiological or psychological costs—chronically exceed the job resources available to meet them. In the North-West Nigerian college of education context, the dominant demands include excessive teaching hours, underfunded practical agriculture programmes, examination marking loads, and administrative bureaucracy; the most deficient resources include collegial support, professional development opportunities, infrastructure adequacy, and compensation adequacy. The model predicts a health impairment pathway from demands-resource imbalance through burnout to degraded instructional quality and performance.

Skaalvik and Skaalvik (2021) stated that the Teacher Self-Efficacy and Burnout framework provides the micro-level mediation pathway through which burnout

degrades instructional quality. The framework proposes that burnout, particularly emotional exhaustion, progressively depletes the cognitive and motivational resources from which instructional quality behaviours are generated: lesson innovation, student-specific feedback formulation, responsive pedagogical adjustment, and the sustained enthusiasm that motivates student engagement. As burnout intensifies, educators progressively withdraw these discretionary instructional behaviours, shifting toward minimum-effort, low-engagement transmission modes that preserve cognitive and emotional resources at the cost of educational effectiveness.

Hakanen et al. (2021) demonstrated, in a longitudinal study of 2,038 Finnish teachers, that emotional exhaustion predicted a significant reduction in instructional quality 12 months later, and that instructional quality fully mediated the emotional exhaustion-to-student engagement pathway. Skaalvik and Skaalvik (2021) found that all three burnout dimensions independently predicted a decline in teacher self-efficacy, with emotional exhaustion showing the largest direct effect on instructional quality ($\beta = -.47$) in a Norwegian teacher sample. Internationally, burnout research in Sub-Saharan African teacher populations is growing but remains concentrated in

secondary school contexts rather than teacher educator populations (Adewale et al., 2021; Oluwole & Fasakin, 2022). Within North-West Nigeria specifically, no multi-institution study had examined the full burnout-instructional quality-student outcomes mediation pathway in the College of Education, Agricultural Teacher Education, establishing the precise empirical gap this study addresses.

Methodology

A cross-sectional multilevel mediation design was employed. The nested data structure of students (Level 1) clustered within educator-class units (Level 2)—required multilevel analytical approaches to correctly partition variance attributable to educator-level predictors (burnout, instructional quality) and student-level outcomes (agricultural knowledge attainment) (Raudenbush & Bryk, 2021; Preacher, Zyphur, & Zhang, 2021). PROCESS macro bootstrapping was

additionally applied at the educator level to estimate mediated effects with bias-corrected confidence intervals (Hayes, 2022).

The target population comprised all agricultural teacher educators at NCCE-accredited colleges of education in the seven North-West states and their NCE III students. Purposive selection of twelve colleges with active agricultural education departments and minimum five-year accreditation standing yielded the institutional sampling frame. From each college, all agricultural teacher educators who had taught at least one NCE III agricultural education course in the 2023/2024 session were recruited (mean = 9 educators per college; total $n = 108$). Six NCE III agricultural education students per educator were randomly selected from available class lists, yielding 648 student participants. Table 1 presents the sample distribution.

Table 1: Sample Distribution by State, Institution, Educator Count, and Student Count

State	Institution	Educators (n)	Students (n)	Total (n)
Sokoto	Sa'adu Zungur College of Education	10	60	70
Kebbi	KSOE, Argungu	9	54	63
Zamfara	Zamfara COE, Maru	9	54	63
Kano	Kano STEAD, Kano	10	60	70
Katsina	KSE College, Kankia	9	54	63
Kaduna	KADCOE, GidanWaya	10	60	70
Jigawa	JIGCOE, Gumel	8	48	56
Sokoto	Shehu Shaagari College of Education	9	54	63
Kebbi	Adamu Augie College of Education	10	60	70
Katsina	Yusuf Bala College of Education	8	48	56
Kaduna	Ameer Sheu College of Education	8	48	56
Kano	Aminu Kano Islamic Legal Studies	8	48	56
Total	12	108	648	756

Three instruments were used. The Maslach Burnout Inventory Educators Survey (MBI-ES; Maslach et al., 2021) is the gold-standard validated instrument for measuring educator burnout across three subscales: emotional exhaustion (EE, 9 items), depersonalisation (DP, 5 items), and reduced personal accomplishment (PA, 8 items), rated on a 7-point frequency scale (0 = Never; 6 = Every day). The MBI-ES has been extensively validated across international educator populations; Cronbach's alpha in the present pilot study with 30 North-West COE educators returned EE $\alpha = 0.87$, DP

$\alpha = 0.79$, PA $\alpha = 0.82$. A 10-item Burnout Antecedents Severity Rating Scale (BASRS) additionally assessed educators' severity ratings of seven identified institutional burnout drivers.

The Agricultural Instructional Quality Observation Protocol (AIQOP) is a researcher-developed 32-item rating scale assessing instructional quality across four dimensions: content depth and accuracy (8 items), student engagement facilitation (8 items), assessment and feedback quality (8 items), and pedagogical innovation (8 items),

rated on a 5-point scale (1 = Very Poor; 5 = Excellent). The AIQOP was completed by the educator as a self-rating and cross-validated against student ratings on the same scale. Expert review returned CVI = 0.91; pilot alpha = 0.88 for the educator self-rating version. The Agricultural Knowledge Attainment Test (AKAT) is a researcher-developed 40-item four-option multiple-choice test covering the NCCE NCE III agricultural education curriculum across soil science, crop production, animal science, and agricultural economics (10 items per domain). Expert review CVI = 0.90; pilot KR-20 = 0.83.

Descriptive statistics characterized burnout prevalence, instructional quality distribution, and AKAT score distribution. Educator-level burnout was classified using Maslach et al.'s (2021) validated cut-off criteria: high EE $\geq$ 27; high DP $\geq$ 10; low PA $\leq$ 33.

Results

Burnout Prevalence Profile

Using Maslach et al.'s (2021) validated cut-off criteria, 61.1% of agricultural teacher educators (n = 66) exhibited high emotional exhaustion scores, 47.2% (n = 51) exhibited high depersonalization, and 58.3% (n = 63) exhibited low personal accomplishment. Only 24.1% (n = 26) fell below high-risk thresholds on all three dimensions, indicating

Hypothesis 1 was tested using Pearson correlation between MBI-ES total score and AIQOP educator self-rating. Hypothesis 2 was tested using multiple regressions at the educator level with mean class AKAT score as the dependent variable, controlling for educator experience, college type, and state. Hypothesis 3 was tested using the PROCESS macro (Model 4), with bootstrapped indirect effects (5,000 resamples) and BCa 95% confidence intervals. Between-group variation in AKAT means attributable to educator-level predictors was confirmed through an interclass correlation (ICC) analysis before applying educator-level mediation. Hypothesis 4 was tested through simultaneous multiple regression, entering all three MBI-ES subscales as predictors of AIQOP, with variance inflation factor (VIF) checks for multicollinearity. All analyses used IBMSPSS Statistics Version 29 with PROCESS Version 4.2.

that full clinical burnout syndrome was absent in only a quarter of the sample. Mean MBI-ES subscale scores were: EE M = 31.44 (SD = 7.82), markedly above the high-burnout threshold of 27; DP M = 10.87 (SD = 3.44), at the high-burnout threshold; PA M = 29.11 (SD = 6.94), below the low-accomplishment threshold of 33. Table 2 presents the burnout antecedents severity ratings.

Table 2: Burnout Antecedents Mean Severity Ratings (N = 108 Educators)

Burnout Antecedent	M (SD)	Rank
Excessive teaching workload	4.62 (0.58)	1
Salary irregularity and inadequacy	4.54 (0.62)	2
Inadequate laboratory and farm resources	4.41 (0.67)	3
Absence of collegial professional support	4.28 (0.71)	4
Poor institutional governance and communication	4.17 (0.74)	5
Limited professional development access	4.09 (0.77)	6
Student disciplinary challenges	3.88 (0.83)	7

Hypothesis 1: Burnout and Instructional Quality

Pearson correlation analysis at the educator level ($n = 108$) revealed a statistically significant large negative relationship between overall MBI-ES burnout scores and AIQOP instructional quality self-ratings, $r(106) = -.67$, $p < .001$. Higher educator burnout was strongly associated with lower self-reported instructional quality across all four AIQOP dimensions. ICC analysis of AKAT scores confirmed that 31.7% of the variance in student agricultural knowledge was attributable to between-educator variation, justifying the educator-level mediation analysis. Hypothesis 1 was rejected.

Hypothesis 2: Burnout and Students' Knowledge Attainment

Multiple regression at the educator level, controlling for years of teaching experience, college resource category, and state, revealed

that educator MBI-ES total score was a significant negative predictor of mean class AKAT score ($\beta = -.48$, $t = -5.97$, $p < .001$). Each one-standard-deviation increase in educator burnout was associated with a 4.82-point reduction in mean class AKAT score (on a 100-point scale), after controlling for experience and institutional factors. The full model explained 53.6% of between-educator AKAT variance, $F(6, 101) = 19.41$, $p < .001$. Hypothesis 2 was rejected.

Hypothesis 3: Mediation by Instructional Quality

PROCESS macro Model 4 bootstrapping (5,000 resamples) estimated a significant indirect effect of educator burnout on mean class AKAT through instructional quality (AIQOP): indirect effect = -0.34 , $SE = 0.049$, BCa 95% CI $[-0.44, -0.25]$ —confidence interval excludes zero, confirming significant mediation. The direct effect of MBI-ES on mean class AKAT was also significant after controlling for AIQOP (β

= -.21, $p = .008$), establishing partial rather than full mediation. The mediated proportion of the total burnout-to-AKAT effect was 58.4%. These results confirm that more than half of the negative impact of educator

burnout on student agricultural knowledge attainment operates through the degradation of instructional quality. Table 3 presents the full mediation model statistics.

Table 3: Mediation Analysis: Burnout, Instructional Quality, and Student AKAT Scores

Path	Effect	SE	t / z	p	BCa 95% CI
MBI-ES → AIQOP (a-path)	-0.58	0.063	-9.21	< .001	[-.704, -.456]
AIQOP → Mean AKAT (b-path)	0.59	0.071	8.31	< .001	[.449, .731]
MBI-ES → Mean AKAT (c-path, total)	-0.47	0.058	-8.10	< .001	[-.585, -.355]
MBI-ES → Mean AKAT (c'-path, direct)	-0.21	0.079	-2.66	.008	[-.367, -.053]
Indirect effect ($a \times b$)	-0.34	0.049	—	—	[-.440, -.252]
Mediated proportion	58.4%				—

Note. All path coefficients are standardized. Indirect effect estimated via 5,000-resample bootstrapping with BCa correction. $N = 108$ educator-class units.

Hypothesis 4: Differential Effects of Burnout Dimensions

Simultaneous multiple regression entering all three MBI-ES subscales as predictors of AIQOP instructional quality revealed that emotional exhaustion was the strongest independent predictor ($\beta = -.51$, $t = -6.44$, $p < .001$), followed by depersonalization ($\beta = -.28$, $t = -3.54$, $p = .001$). Reduced personal accomplishment did not reach significance in the simultaneous model ($\beta = -.09$, $p = .184$), suggesting its instructional quality effects operate primarily through its covariance with emotional exhaustion. VIF values ranged from 1.44 to 2.17, confirming

absence of problematic multicollinearity. Hypothesis 4 was rejected: the three burnout dimensions differentially predict instructional quality, with emotional exhaustion and depersonalization as the significant independent drivers.

Discussion

The most urgent finding of this study is that 61.1% of agricultural teacher educators in the sampled North-West Nigerian colleges of education exhibited high emotional exhaustion a burnout prevalence rate that substantially exceeds even the elevated rates reported in Nigerian secondary teacher burnout studies (Oluwole & Fasakin, 2022;

Adewale et al., 2021) and that confirms the existence of a systemic occupational welfare crisis specifically within the agricultural teacher educator workforce. That this crisis is directly cascading into student knowledge outcomes, with burnout explaining 53.6% of between-educator AKAT variance and with instructional quality mediating 58.4% of the total burnout effect on student attainment, elevates the burnout problem from a staff welfare concern to an educational quality emergency with direct implications for the agricultural science teaching capacity of the thousands of secondary school classrooms that North-West Nigerian college graduates will serve.

The finding that emotional exhaustion is the dominant instructional quality predictor ($\beta = -.51$) among the three burnout dimensions is consistent with the JD-R model's health impairment pathway (Bakker & Demerouti, 2021) and with Skaalvik and Skaalvik's (2021) demonstration that the depletion of emotional resources—not cognitive skill loss or attitude change is the primary mechanism through which burnout degrades teaching effectiveness. An emotionally exhausted agricultural teacher educator cannot sustain the attentive responsiveness to individual student agricultural misconceptions, the enthusiasm for agronomic problem-solving that makes content memorable, or the reflective lesson redesign that converts student performance

data into instructional improvement. These are energetically expensive instructional behaviours that emotional resource depletion specifically forecloses.

The identification of salary irregularity ($M = 4.54$) and excessive workload ($M = 4.62$) as the two most severely rated burnout antecedents provides direct intervention targets for NCCE policy and state government action. The JD-R model's resource-restoration logic (Bakker & Demerouti, 2021) predicts that reducing demands (normalizing salary payment, reducing non-teaching administrative loads) will produce larger and more durable burnout reductions than adding resources alone, because demands-resource imbalance rather than resource deficiency per se is the proximate burnout driver. A targeted policy package combining workload rationalization, reliable salary payment, and structured collegial support system development would address the three highest-rated antecedents simultaneously and is the most theoretically and empirically supported intervention available to institutional and government actors.

The partial nature of the mediation (58.4% mediated, 41.6% direct) reveals that burnout exerts an additional direct negative pathway to student outcomes beyond instructional quality degradation. This residual direct effect is consistent with research showing that burned-out educators reduce the

frequency of student interaction and formative feedback independent of formal instructional quality they complete fewer mark-return cycles, respond less fully to student queries, and invest less in supporting struggling students—all behaviours that affect student outcomes without being captured by formal instructional quality ratings (Hakanen et al., 2021; Maslach et al., 2021). Intervention strategies should therefore address both the instructional quality pathway (through professional development and teaching support) and the direct interaction pathway (through manageable student-educator ratios and structured student support protocols).

Conclusion

This study provides the first multi-institution multilevel empirical evidence that agricultural teacher educator burnout in North-West Nigerian colleges of education is at crisis prevalence levels (61.1% high emotional exhaustion) and that this burnout cascades into measurably degraded instructional quality and student agricultural knowledge outcomes, with instructional quality mediating 58.4% of the total burnout-to-outcomes effect. Emotional exhaustion and depersonalization are the dominant predictors of instructional quality, and excessive workload, salary irregularity, and resource inadequacy are the highest-severity burnout antecedents. These findings demand

urgent coordinated response from NCCE, state governments, and college administrations.

Recommendations

The following recommendations are advanced:

1. State governments and college boards in the seven North-West states should conduct immediate audits of agricultural teacher educator salary payment records, workload allocations, and non-teaching administrative duty assignments, with binding targets for salary payment regularity, maximum teaching-hour ceilings, and administrative load redistribution within one academic session.
2. NCCE should incorporate educator occupational welfare standards—including maximum MBI-ES threshold benchmarks and minimum collegial support system requirements into its college of education accreditation criteria, making staff welfare evidence a condition for full accreditation renewal rather than a background consideration.
3. College administrations should establish structured Agricultural Teacher Educator Collegial Support

Networks meeting fortnightly to provide peer mentoring, shared lesson resource development, and professional problem-solving support—the collegial resource dimension rated fourth most severely deficient by educators in this study.

4. Future research should employ a randomized pre-post intervention design to evaluate whether a six-month targeted burnout reduction programme—combining workload adjustment, structured collegial support, and reflective practice development—produces measurable improvements in MBI-ES scores, AIQOP instructional quality, and student AKAT attainment.

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