

The Influence of Transformational Leadership and Organisational Learning Culture on Staff Training Outcomes in Higher Education: A Mediation Analysis

Senita Osei Badu¹, Abigail Dzama Anderson², Lorna Zariatu Adam³,
Kofi Adu⁴, Daniel Inkoom^{5*}, Ruth Bediako⁶

¹Registrar's Offices, Kwame Nkrumah University of Science and Technology, Kumasi, Ashanti Region, Ghana, ²E-learning Centre, Kwame Nkrumah University of Science and Technology, Kumasi, Ashanti Region, Ghana, ³Office of the Principal, Nyankpala Campus, University for Development Studies, Tamale, Northern Region, Ghana, ⁴Kwame Nkrumah University of Science and Technology, Kumasi, Ashanti Region, Ghana, ⁵Department of Guidance and Counselling, University of Cape Coast, Cape Coast, Central Region, Ghana, ⁶Faculty of Agriculture, Kwame Nkrumah University of Science and Technology, Kumasi, Ashanti Region, Ghana. *Corresponding Author's Email: daniel.inkoom@becoled.edu.gh

Abstract

This study examined associations among transformational leadership, organisational learning culture and staff training outcomes among non-academic staff in Ghanaian public universities. Using a cross-sectional survey design, data were collected from 450 non-academic staff. Validated measures assessed transformational leadership, organisational learning culture, leader-member exchange, institutional policies and resources, and HR training outcomes, including participation, accessibility and perceived quality. Data were analysed using regression, bootstrapped mediation and moderation analyses. Transformational leadership was significantly associated with training participation ($\beta = 0.38$, $p < 0.001$), while organisational learning culture was significantly associated with the composite accessibility and perceived quality outcome ($\beta = 0.52$, $p < 0.001$). Organisational learning culture partially mediated the relationship between transformational leadership and HR training outcomes. Institutional policies and resources also moderated the relationship between leader-member exchange and training participation ($b = 0.11$, $p = 0.008$). The findings indicate that staff training outcomes in Ghanaian public universities are associated with leadership behaviour, learning culture, relational quality and institutional support. Because the design is cross-sectional and relies on self-reported data, the findings are interpreted as associations rather than causal effects.

Keywords: Ghanaian Public Universities, Institutional Support, Leader-member Exchange, Transformational Leadership, Organisational Learning Culture, Staff Training.

Introduction

Higher education institutions are operating in a period of rapid transformation shaped by digitalization, changing funding arrangements and increasing expectations for accountability, responsiveness and relevance (1). Universities depend not only on academic staff but also on administrative, professional, technical and support personnel who sustain admissions, finance, estates, procurement, student services, records management and regulatory compliance. Their competence affects institutional efficiency and the quality of the student experience. Staff training should therefore be understood as a strategic component of institutional capacity, particularly where universities must respond to new technologies and increasingly complex governance demands (2, 3). Ghanaian public universities

provide a particularly important setting for examining these issues. Expansion in higher education participation has increased administrative complexity, yet public universities continue to operate within a governance environment shaped by national regulation, public funding pressures and demands for quality assurance and accountability (4-6). In such a context, decisions about who receives training, which training is funded and whether new skills can be used at work may depend on more than individual motivation. Institutional policy clarity, approval systems, infrastructure and resource availability may enable or restrict the impact of otherwise supportive leadership. This context makes Ghanaian public universities analytically useful for understanding staff development in resource-

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constrained public higher education systems. The present study focuses on non-academic staff. This group comprises administrative, professional, technical and support employees whose primary responsibilities are operational and service-oriented rather than teaching and research. Their developmental requirements are not identical to those of faculty. Academic career progression is commonly linked to research outputs, teaching portfolios, scholarly visibility and grant activity. In contrast, progression and effectiveness among non-academic staff are closely tied to administrative competence, service delivery, digital literacy, financial accountability, records management, supervision and compliance with institutional procedures. Although higher education research has increasingly recognized the importance of professional and 'third space' staff, their training experiences remain less visible than faculty development concerns (2). Treating non-academic staff as a distinct analytical population is therefore necessary rather than merely convenient.

The first explanatory construct in this study is transformational leadership. Transformational leaders articulate a meaningful vision, provide individualized support, intellectually stimulate staff and motivate followers beyond routine compliance (7). Within a university administrative environment, such leadership may make staff development more purposeful by presenting training as part of institutional improvement and personal growth. Evidence across organisational settings indicates that transformational leadership is associated with employee engagement, motivation and performance-related outcomes (8). Accordingly, staff who perceive their supervisors or institutional leaders as transformational may be more likely to participate in available training opportunities.

The second construct is organisational learning culture. A learning culture reflects shared norms, values and practices that encourage inquiry, knowledge sharing, reflection and the application of learning in everyday work. Past studies describe learning-oriented organisations as those that embed continuous learning, dialogue, collaboration and supportive systems into organisational practice (9). The Dimensions of the Learning Organization Questionnaire provides an established means of examining these conditions

(10). In universities where learning is institutionally valued, staff may perceive training opportunities as more accessible, relevant and beneficial. Previous research has linked organisational learning culture with transfer climate and perceived organisational innovation, suggesting that cultural conditions shape how learning is valued and applied (11).

The relationship between transformational leadership and training outcomes may not be solely direct. Leadership practices can help create a work environment in which learning is encouraged, recognised and supported. This study therefore proposes that organisational learning culture mediates the association between transformational leadership and HR training outcomes. Mediation analysis is appropriate where theory suggests that an independent variable is associated with an outcome partly through an intermediary process (12). Here, the proposed mechanism is that transformational leaders foster a stronger learning culture, which is then associated with improved staff training outcomes. A further dimension concerns leader-member exchange (LMX), which focuses on the quality of the dyadic relationship between an employee and an immediate supervisor. High-quality LMX relationships are characterised by trust, respect, support and reciprocal obligation (13, 14). Such relationships may facilitate participation in training because supervisors are more likely to communicate opportunities, provide encouragement or recommend staff for development. However, relational quality alone may not be sufficient. In a public university system where training opportunities depend on formal policies, available funding, infrastructure and administrative approvals, the benefits of LMX may be strengthened or weakened by institutional support. Institutional theory similarly emphasises that formal structures and resource dependencies shape organisational action (15).

Existing research has commonly examined leadership, learning culture, relational quality or institutional context separately. Less is known about how these factors operate together in relation to non-academic staff training within Ghanaian public universities. This study addresses that gap through an integrated model examining: the association between transformational leadership and training participation; the

association between organisational learning culture and training accessibility and perceived quality; the mediating role of organisational learning culture; and the moderating role of

institutional policies and resources in the LMX-training participation relationship. The conceptual relationships tested in the study are summarised in Figure 1.

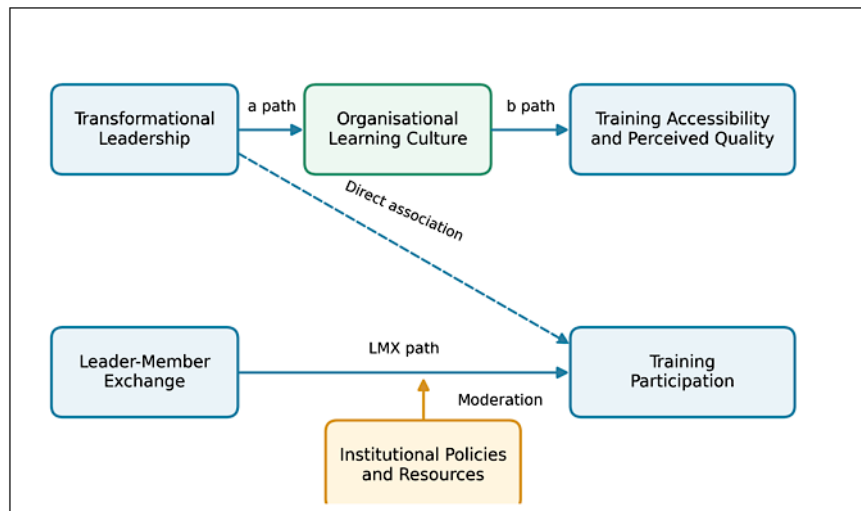


Figure 1: Conceptual Framework of Transformational Leadership, Learning Culture and Contextual Factors on Staff Training Outcomes. Solid Arrows Indicate the Hypothesised Direct and Mediating Associations. The Dashed Arrow Indicates the Hypothesised Association Between Transformational Leadership and Training Participation. The Vertical Arrow Indicates that Institutional Policies and Resources Moderate the Leader-member Exchange-training Participation Relationship. (TL= Transformational Leadership; OLC = Organisational Learning Culture; LMX = Leader-Member Exchange)

Research Hypotheses

H₀₁: Transformational leadership does not have a significant positive association with staff participation in HR training.

H₀₂: Organisational learning culture does not have a significant positive association with the composite training accessibility and perceived quality outcome.

H₀₃: Organisational learning culture does not significantly mediate the relationship between transformational leadership and HR training outcomes.

H₀₄: Institutional policies and resources do not significantly moderate the relationship between leader-member exchange quality and staff participation in HR training.

Methodology

Study Design and Setting

A quantitative, cross-sectional survey design was employed to examine relationships among the study variables at one point in time. This design is suitable for estimating naturally occurring associations without manipulating participants or institutional conditions (16). The study focused on non-academic staff in Ghanaian public universities,

including administrative, professional, technical and support personnel whose duties contribute to operational and service delivery functions.

Population, Institutional Selection and Sampling

A multi-stage sampling strategy was employed. First, five public universities were purposively selected using maximum-variation logic. The intention was not to claim statistical representativeness at institutional level, but to include universities with differing characteristics, including institutional age, size, geographic location, administrative complexity and programme orientation. This rationale was adopted because leadership, learning culture and training support may operate differently across established and newer institutions or across institutions facing different resource conditions.

Second, within each selected university, stratified random sampling was used to select respondents from administrative units such as Registry, Finance, Academic Affairs, Estates, Library and related departments. Sample size determination followed Krejcie and Morgan's finite-population guidance (17), which recommends at least 375 respondents for a population of 15,000 at a 95%

confidence level and 5% margin of error. To allow for non-response, 480 staff members were approached, of whom 450 provided usable responses. Non-academic staff are heterogeneous. The questionnaire therefore captured department or administrative unit, job category, educational background, years of service and prior participation in staff training. These variables describe the sample. The reported hypothesis tests use the pooled non-academic staff sample; occupational subgroup differences were not modelled as separate effects. This decision is recognised as a limitation and a direction for future study.

Instrument and Measures

Data were collected using a structured self-administered questionnaire administered electronically through Google Forms. All scale items were measured on a five-point Likert scale ranging from 1 = Strongly Disagree to 5 = Strongly Agree. The questionnaire contained the following sections:

- (a) Demographic and occupational information: age, gender, department or administrative unit, years of service, educational background, job category and prior participation in staff training.
- (b) Transformational leadership: the 20-item transformational component of the Multifactor Leadership Questionnaire short form, covering idealised influence, inspirational motivation, intellectual stimulation and individualized consideration (18).
- (c) Organisational learning culture: the 14-item short form of the Dimensions of the Learning Organization Questionnaire, assessing continuous learning, dialogue, knowledge sharing, team learning and learning-supportive systems (9, 10).
- (d) Leader-member exchange: the 7-item LMX-7 scale, assessing trust, professional respect, supervisor support and relationship quality (13).
- (e) Institutional policies and resources: ten context-specific items assessing clarity and fairness of staff development policy, availability of funding, training infrastructure and administrative support. Institutional policy support and resource adequacy are conceptually distinguishable but were modelled as an integrated institutional support construct because policy approval, funding and

implementation operate together in shaping training access in the public university setting (4, 5, 15).

- (f) HR training outcomes: twelve items measuring training participation, training accessibility and perceived training quality. Participation refers to engagement in training activities. Accessibility concerns perceived availability, fairness and ease of access. Perceived quality concerns relevance, usefulness, delivery and applicability of training. Accessibility and quality were treated as distinct dimensions conceptually and retained as a composite outcome only for the relevant hypothesis where measurement evidence supports their coherence.

Data Collection and Ethics

The questionnaire link was distributed through institutional email channels with an information sheet describing the purpose of the study, voluntary participation, confidentiality and anonymity. Two reminder messages were issued at two-week intervals to improve response. Ethical approval was obtained from the Simon Diedong Dombo University of Business and Integrated Development Studies Institutional Review Board (approval no. SDD-UBIDS/REC/2023/124), and institutional permission was secured from the participating universities. Informed consent was obtained before questionnaire completion.

Data Analysis

Data were screened for missing values, outliers and the assumptions relevant to regression-based analyses, including linearity, homoscedasticity, normality of residuals and multicollinearity. Descriptive statistics were computed using frequencies, means and standard deviations. Internal consistency was evaluated using Cronbach's alpha. Construct coherence was assessed through confirmatory factor analysis, guided by established measurement principles (19). Because the data were gathered using a single self-report instrument, the risk of common-method bias was considered in interpreting the results (20).

Direct relationships were assessed using regression analysis. Mediation was tested using Hayes' PROCESS Macro Model 4 with 5,000 bootstrap samples, while moderation was evaluated using PROCESS Model 1 (21, 22). Statistical significance was assessed at $p < 0.05$.

Throughout the interpretation, the cross-sectional design is recognised as permitting only association-based, not causal, conclusions.

Results

The results are organised according to the study hypotheses. Before hypothesis testing, descriptive

analysis examined the training methods used and the perceived barriers to distance and internet-based training. Table 1 presents the utilisation rates and perceived effectiveness ratings for the five training methods.

Table 1: Descriptive Statistics for Training Method Utilisation and Perceived Effectiveness

Training Method	Utilisation Rate (%)	Perceived Effectiveness (M)	SD
Career/Development Training	92	3.54	0.62
Workshops/Seminars	85	3.41	0.58
On-the-Job Mentoring	78	3.38	0.61
In-Service Training	70	3.12	0.59
Distance/Internet-Based Training	25	2.66	0.81

Note: N = 450. Perceived effectiveness was measured on a five-point Likert scale ranging from 1 = Very Ineffective to 5 = Very Effective, SD- Standard Deviation.

As shown in Table 1, career/development training and workshops/ seminars were the most frequently utilised methods and received the highest mean effectiveness ratings. Distance/

internet-based training was least utilised and received the lowest perceived effectiveness rating. Figure 2 presents the perceived barriers to the adoption of distance and internet-based training.

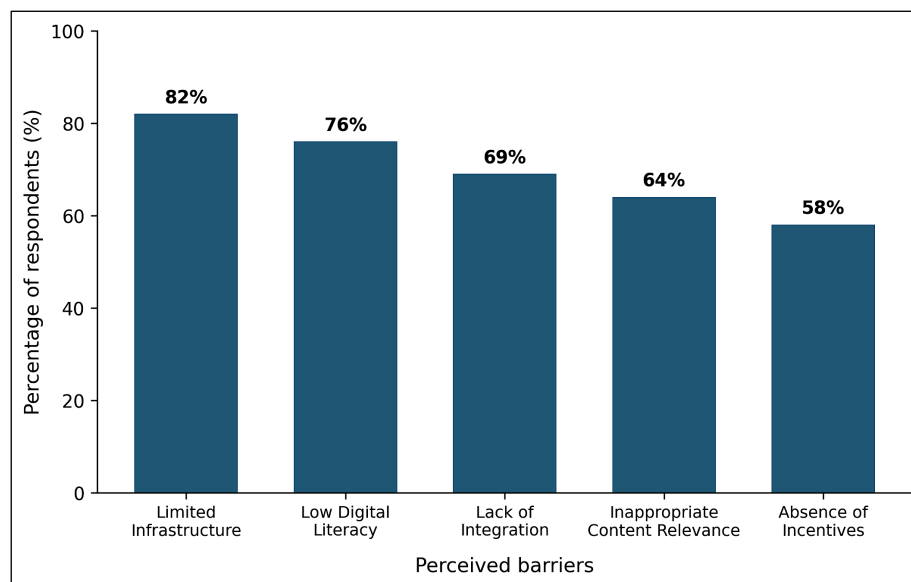


Figure 2: Perceived Barriers to Adoption of Distance and Internet-based Training, N = 450. Respondents could Select More than One Barrier. Therefore, The Percentages do not Sum to 100%

Table 2: Summary of Mediation Analysis for Transformational Leadership, Organisational Learning Culture and HR Training Outcomes

Path and Effect	B	SE	t	p	95% CI
Total effect (c)	0.45	0.05	8.76	<0.001	[0.35, 0.55]
Direct effect (c')	0.16	0.05	3.15	0.002	[0.06, 0.26]
a) path: TL → OLC	0.61	0.04	15.25	<0.001	[0.53, 0.69]
b) path: OLC → Outcomes	0.48	0.04	12.00	<0.001	[0.40, 0.56]
Indirect effect (ab)	0.29	0.04	—	—	[0.21, 0.38]

Note: N = 450. TL = Transformational Leadership; OLC = Organisational Learning Culture; B = unstandardized coefficient; SE = standard error; t = t-statistic; p = probability value; CI = confidence interval. Confidence interval for the indirect effect is a bias-corrected bootstrap confidence interval based on 5,000 samples.

Hypothesis Testing

Transformational Leadership and Training Participation

A simple linear regression tested H_{01} . Transformational leadership was significantly and positively associated with staff training participation, $\beta = 0.38$, $p < 0.001$. The model accounted for 14% of the variance in training participation, $R^2 = 0.14$, $F(1, 448) = 74.12$, $p < 0.001$. H_{01} was therefore rejected.

Organisational Learning Culture and the Accessibility-quality Composite

A simple linear regression tested H_{02} , with organisational learning culture as the predictor and the composite training accessibility and perceived quality outcome as the dependent variable. Organisational learning culture was significantly and positively associated with the composite outcome, $\beta = 0.52$, $p < 0.001$. The model

accounted for 27% of the variance in the composite outcome, $R^2 = 0.27$, $F(1, 448) = 167.45$, $p < 0.001$. H_{02} was therefore rejected.

Mediating Role of Organisational Learning Culture

Mediation was tested using PROCESS Model 4 with 5,000 bootstrap samples. The results are presented in Table 2 and illustrated in Figure 3.

The total effect of transformational leadership on HR training outcomes was significant. Transformational leadership was significantly associated with organisational learning culture, which was in turn significantly associated with HR training outcomes after accounting for transformational leadership. The direct effect remained significant but was reduced, while the bootstrap interval for the indirect effect excluded zero. Organisational learning culture therefore statistically partially mediated the relationship, and H_{03} was rejected.

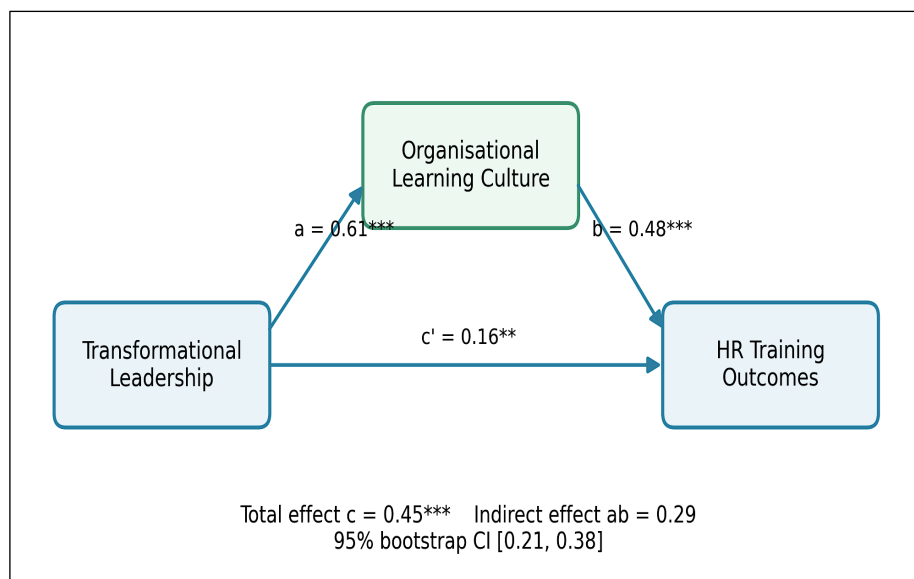


Figure 3: Mediation Model for Transformational Leadership, Organisational Learning Culture and HR Training Outcomes, $N = 450$. Values are reported coefficients from the mediation analysis. $**p < 0.01$; $***p < 0.001$. Indirect effect $ab = 0.29$, 95% bias-corrected bootstrap CI [0.21, 0.38]

Table 3: Moderation Analysis for Leader-Member Exchange, Institutional Support and Training Participation

Predictor	B	SE	t	p
Constant	2.45	0.18	13.61	<0.001
Leader-Member Exchange (LMX)	0.20	0.06	3.33	0.001
Institutional Support	0.35	0.06	5.83	<0.001
LMX $\times$ Institutional Support	0.11	0.04	2.66	0.008

Note: $N = 450$. B = unstandardised coefficient; SE = standard error; t = t-statistic; p = probability value; $R^2 = 0.31$ for the full model. Institutional support comprises policy and resource dimensions treated as an integrated construct in this analysis.

Moderating Role of Institutional Policies and Resources

Moderation was tested using PROCESS Model 1. Institutional policy support and resource adequacy were retained as the integrated moderator, institutional support, because formal policies, funding approval, infrastructure and logistical support jointly condition staff access to training in the university context. The interaction between LMX and institutional support was significant, $b = 0.11$, $p = 0.008$. Table 3 summarizes

the regression results for this moderation model. Figure 4 illustrates the interaction between LMX and institutional support. Predicted values were calculated from the regression coefficients reported in Table 3. Simple slope analysis indicated that the association between LMX and training participation was strong and positive at high institutional support (+1 SD), $b = 0.33$, $p < 0.001$, but weak and non-significant at low institutional support (-1 SD), $b = 0.08$, $p = 0.25$. Thus, H_{04} was rejected.

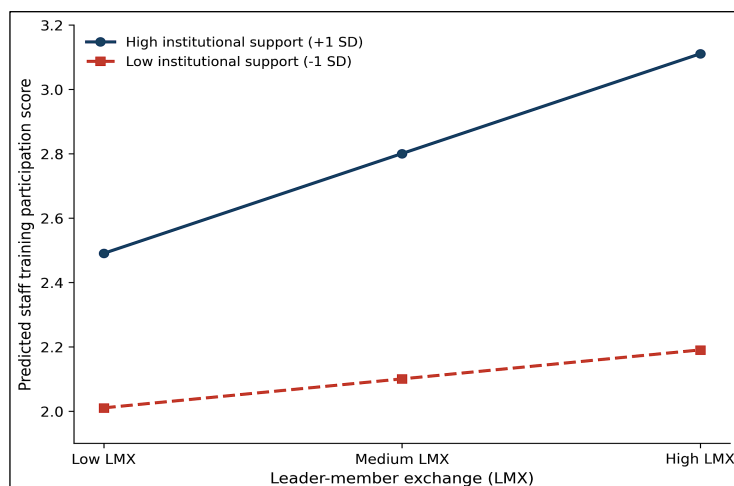


Figure 4: Moderating Effect of Institutional Support on the Relationship between LMX and Training Participation

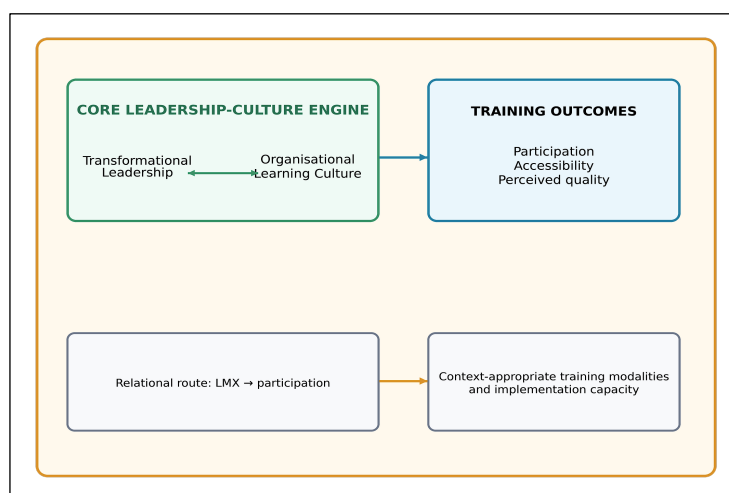


Figure 5: Contextually Bound HRD Ecosystem Framework for Higher Education, the Foundational Institutional Envelope Represents Policies, Funding, Infrastructure, Administrative Procedures and Regulatory Conditions

Discussion

This study examined an integrated model of staff training outcomes among non-academic staff in Ghanaian public universities. Four findings are central. Transformational leadership was positively associated with training participation;

organisational learning culture was positively associated with perceived accessibility and quality of training as modelled in the composite outcome; organisational learning culture statistically mediated the relationship between

transformational leadership and training outcomes; and institutional policies and resources moderated the association between leader-member exchange and training participation. Taken together, the findings suggest that staff development in public universities is shaped by relational and cultural conditions as well as institutional capacity.

The Ghanaian public university context is important to the interpretation of these findings. Ghana's higher education sector has expanded while remaining influenced by public accountability, regulatory structures, infrastructure requirements and constraints on institutional resources (4-6). Within such conditions, training participation is unlikely to depend only on whether individual staff are motivated or whether a supervisor is supportive. Training opportunities must also be approved, financed, made accessible and connected to systems that allow staff to apply their learning. The study therefore contributes contextual evidence from a higher education system that is under-represented in mainstream human resource development research.

The focus on non-academic staff is also a substantive contribution. Administrative, professional, technical and support personnel are often grouped together or omitted in studies centred on academic work. Yet their performance is directly related to records accuracy, financial management, procurement, student services, digital administration, compliance and institutional continuity. Their incentives and developmental needs are consequently distinct from academic staff whose progression is predominantly associated with teaching, publication, research funding and scholarly recognition (2). The present findings indicate that leadership and learning culture matter for this neglected staff population, while also showing why future research must examine differences among administrative, professional, technical and support subgroups.

Recent scholarship reinforces the need to treat professional and non-academic staff as a strategically important workforce rather than a residual administrative category. Systematic reviews show that professional staff increasingly occupy boundary-spanning roles and contribute to institutional knowledge development, while recent competency research identifies interpersonal, self-management and professional

capabilities as central to service delivery in higher education (23-25).

The positive association between transformational leadership and training participation supports the proposition that staff are more likely to engage in development activities when leaders communicate a credible purpose, offer encouragement and value staff growth. This interpretation is consistent with transformational leadership theory and research linking transformational leadership to employee motivation and performance outcomes (7, 8). Importantly, the cross-sectional design does not establish that leadership causes participation; employees who have greater training exposure may also evaluate their leaders more favorably.

The role of organisational learning culture is particularly important. A university may offer training, yet staff may not perceive it as accessible or worthwhile unless learning is encouraged in day-to-day practice. The finding aligns with research showing that learning culture relates to transfer climate and perceptions of organisational innovation (9-11). It also gives practical meaning to the mediation result: leadership may be associated with better training outcomes partly because it is experienced through norms of dialogue, knowledge sharing, encouragement and application of learning. The indirect effect is statistically supported, but its temporal order should be tested through longitudinal or multi-wave designs.

Contemporary evidence also supports the mechanisms examined in this study. Transformational leadership has been linked to employee learning, knowledge sharing and performance-related outcomes (26, 27), while learning-organisation research highlights the importance of embedded systems, teamwork and continuous learning (28). Training-transfer studies further indicate that organisational intervention, social support and employees' intention to apply learning influence whether development activities change workplace behaviour (29, 30).

The moderation finding adds a structural qualification to leadership-centred explanations. High-quality leader-member exchange was more strongly associated with participation under conditions of stronger institutional support. This implies that trusted supervisor relationships can encourage development, but may be insufficient

when policies are unclear, funding is inadequate, approval systems are restrictive or infrastructure is weak. The pattern is consistent with institutional theory, which emphasises that formal rules and resource dependencies condition organisational action (15). It is also reflected in the descriptive evidence that limited infrastructure and low digital literacy were the most frequently perceived barriers to distance and internet-based training.

The Contextually Bound HRD Ecosystem Framework in Figure 5 summarises these implications. The framework synthesizes the study findings as a context-sensitive interpretive model. It is a theory-building representation and was not tested as an independent structural model in the present cross-sectional analysis. The framework should be regarded as a theory-building interpretation rather than as a separately validated model. It treats institutional policies and resources as the enabling environment within which leadership, learning culture and relational support can translate into training outcomes. It further proposes that universities facing substantial constraints may obtain immediate benefit from context-appropriate, relationally supported modalities such as workshops and mentoring while progressively strengthening digital infrastructure and digital competence.

Practically, universities should combine leadership development with clear and equitable staff development policies, budgetary provision and mechanisms for applying learning at work. Training needs assessments should distinguish among administrative, technical, professional and support roles, rather than assume that one programme fits all non-academic staff. Human resource units should also monitor participation, access and quality separately, even where a composite indicator is statistically defensible, because each dimension points to different corrective actions.

Limitations and Future Research

Directions

Several limitations qualify the interpretation of the findings. First, the cross-sectional design prevents causal inference and does not establish the temporal sequence assumed in the mediation model. Future studies should use longitudinal, time-lagged or intervention designs to determine whether leadership precedes changes in learning culture and training outcomes.

Second, all principal measures were self-reported, creating the possibility of common-method bias and socially desirable responses (20). Future research should combine staff perceptions with training attendance records, budget data, supervisor reports and measures of post-training skill application.

Third, although five universities were selected to capture variation within Ghanaian public higher education, the sample does not represent all public universities statistically and the findings should not be generalised uncritically to private institutions or other national systems. Comparative studies across countries and institutional types would strengthen external validity.

Fourth, institutional policies and resource adequacy were combined as an institutional support moderator because they are operationally interdependent in the setting studied. Future analyses should test the two dimensions separately and compare their individual and interactive boundary effects. Fifth, the study used a pooled non-academic staff sample. Future research should model occupational subgroup differences and account for the nesting of staff within institutions through multilevel analysis where sufficient institutional samples are available.

Conclusion

This study demonstrates that staff training outcomes among non-academic staff in Ghanaian public universities are associated with a combination of leadership, organisational culture, relational support and institutional conditions. Transformational leadership was positively associated with training participation, and organisational learning culture was associated with broader perceptions of access and quality. The mediation finding suggests that leadership is linked to training outcomes partly through a learning-supportive organisational environment. The moderation finding further indicates that supportive leader-member relationships translate more strongly into participation when institutional policies and resources are favourable. These results carry an important practical message. Ghanaian public universities cannot rely on motivational leadership alone to improve staff development. They need transparent training

policies, equitable access procedures, adequate budgets, usable infrastructure and opportunities for staff to apply new competence in their work. They should also recognize the distinct development requirements of non-academic staff and design training around administrative service quality, digital competence, financial accountability, records management and supervision. The conclusions remain bounded by the cross-sectional, self-reported and single-country nature of the study. The findings support theory-informed associations rather than definitive causal claims. Future studies should report outcome dimensions separately as well as jointly were justified by measurement evidence, distinguish policy support from resource adequacy, investigate occupational subgroups and employ longitudinal or multilevel designs. Subject to these qualifications, the study contributes a contextually grounded account of how public universities can strengthen the development of the staff whose work sustains institutional functioning and the student experience.

Abbreviations

CFA: Confirmatory Factor Analysis, CI: Confidence Interval, DLOQ: Dimensions of the Learning Organization Questionnaire, HEI: Higher Education Institution, HR: Human Resource, HRD: Human Resource Development, LMX: Leader-Member Exchange, MLQ: Multifactor Leadership Questionnaire, OLC: Learning Culture, SPSS: Statistical Package for the Social Sciences.

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Author Contributions

Senita Osei Badu: Data Collection, Writing- Original Draft, Abigail Dzama Anderson: Ethics Documentation, Data Analysis, Lorna Zariatu Adam: Literature Review, Verification of Cited Sources, Kofi Adu: Conceptualization, Proofreading, Visualization, Daniel Inkoom: Data Curation, Manuscript Review, Principal Investigation, Ruth Bediako: Data Collection,

Proofreading. All authors reviewed, revised and approved the final version of the manuscript.

Conflict of Interest

The authors declare no competing interests in relation to this study or its publication.

Data Availability

The data supporting the findings of this study are available from the corresponding author upon reasonable request. The data are not publicly available because they include information obtained from staff respondents under conditions of confidentiality and ethical restriction.

Declaration of Artificial Intelligence (AI) Assistance

All figures were prepared by the authors from the study data and the reported model specifications using standard plotting and diagramming software. During manuscript revision, the authors used ChatGPT (OpenAI) and Grammarly for language editing, organisational refinement and assistance in improving the visual presentation of the figures. These tools were not used to generate or alter research data, conduct the reported statistical analyses, fabricate results or determine the scientific conclusions. All authors independently verified every figure, numerical result, citation, interpretation and conclusion and accept full responsibility for the originality, accuracy and integrity of the manuscript.

Ethics Approval

Ethical approval for the study was obtained from the Simon Diedong Dombo University of Business and Integrated Development Studies Institutional Review Board (approval no. SDD-UBIDS/REC/2023/124). Institutional permission was secured from the participating universities. Participation was voluntary, and informed consent was obtained before respondents completed the questionnaire. Responses were treated confidentially and used only for research purposes.

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