

Human Capital Strategies for Competitive Edge: Linking Workforce Skills and Training to Firm Performance

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Abstract

This study examines how human capital strategies – specifically workforce skills development and employee training – contribute to competitive advantage and firm performance. A 2023 survey dataset of 713 Ghanaian firms is analyzed to link training practices and skill levels with performance indicators. Using descriptive analysis and regression models, the study evaluates the impact of formal employee training and perceived skill constraints on firm outcomes (productivity growth, innovation adoption, etc.), controlling for firm size and finance access. Firms providing formal training report significantly higher labor productivity and innovation rates, while an inadequately skilled workforce is associated with poorer performance. The benefits of training are pronounced in contexts of skill deficits, suggesting training mitigates human capital constraints. Strategically investing in workforce development emerges as a key lever for competitiveness in emerging economies. Policymakers and managers should prioritize employee training to enhance skills and drive sustainable firm performance. This research integrates human capital theory with empirical evidence from an African context, highlighting training as a strategic resource for competitive advantage.

Keywords: competitive advantage, firm performance, human capital, workforce skills and training

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1.0 Introduction

1.1 Background

In today's knowledge-driven economy, a firm's human capital—the skills, knowledge, and abilities of its workforce—is widely recognized as a critical source of competitive advantage. Organizations that strategically develop employee skills through training can achieve superior innovation, adaptability, and performance outcomes (Ployhart, 2021; Rukundo & Byamukama, 2025). Human capital theory suggests that investments in education and training enhance worker productivity, which in turn should improve organizational results (Becker, 1964, as cited in Nafukho & Muya, 2022). Similarly, the resource-based view (RBV) of the firm posits that human capital, when valuable and unique, can provide a sustained competitive advantage. Recent research in strategic human resource management (SHRM) emphasizes that it is not merely the presence of skilled employees, but how firms develop and utilize those skills, that drives performance (Garavan et al., 2021; Ployhart, 2021).

1.2 Research Gap

Despite the recognized importance of human capital, many firms in emerging economies continue to face significant challenges. Skill gaps and an inadequately educated workforce are frequently cited as severe obstacles to business growth (Njinyah et al., 2024). African enterprises often report shortages of skilled labor

that constrain productivity and innovation (Rukundo & Byamukama, 2025). Although prior studies indicate that training investments can yield substantial performance benefits, especially where general workforce education is low (Zhai et al., 2024), empirical evidence from sub-Saharan Africa remains limited. In particular, there is insufficient research on how firm-level training initiatives interact with skill constraints to influence performance outcomes in developing-country contexts like Ghana.

1.3 Significance of the Study

This study contributes to the literature in several ways. Theoretically, it extends human capital theory and RBV by testing whether firm-level training and workforce skill development translate into measurable performance advantages in a developing economy. Practically, it offers evidence to managers and policymakers on whether investments in employee training can mitigate skill shortages and foster competitiveness. By focusing on Ghana, the study also provides context-specific insights for sub-Saharan Africa, where education and labor market challenges are particularly acute.

1.4 Research Objectives

The specific objectives of this study are to:

1. Examine the relationship between workforce training and firm performance outcomes (productivity, innovation, and growth).
2. Investigate whether workforce skill constraints hinder firm performance.
3. Explore whether training investments moderate the negative effects of skill constraints on firm performance.

1.5 Research Questions

Based on the above objectives, the study addresses the following research questions:

- RQ1: To what extent does formal employee training influence firm performance outcomes?
- RQ2: How do workforce skill constraints affect firm performance?
- RQ3: Can firm-level training offset or mitigate the negative effects of inadequate workforce education on performance?

1.6 Hypotheses

Drawing from human capital theory and RBV, the following hypotheses are proposed:

- **H1:** Firms that invest in formal employee training exhibit higher productivity than those that do not.
- **H2:** Firms that invest in formal employee training are more likely to innovate than those that do not.
- **H3:** Firms with higher workforce skill constraints experience lower performance outcomes.
- **H4:** Training investments moderate the relationship between skill constraints and firm performance, such that the negative effect of skill constraints is weaker for firms that train their employees.

2.0 Literature Review

2.1 Conceptual Framework: Human Capital and Competitive Advantage

Human capital refers to the skills, education, experience, and abilities of employees that generate economic value for firms. As Becker (1964) argued, such capital is developed through investments in education and training, which enhance productivity and earnings potential. Contemporary perspectives view employees as strategic assets whose knowledge and competencies drive innovation and organizational success (Subramaniam & Youndt, 2005; Ployhart, 2021). A well-trained workforce improves efficiency, quality, customer service, and innovation, all of which strengthen competitive advantage (Attia et al., 2022; Winoto Tj et al., 2025). The Resource-Based View (RBV) explains why human capital can provide sustainable competitive advantage.

Resources that are valuable, rare, inimitable, and non-substitutable (VRIN) yield superior performance (Barney, 1991). Human capital meets these criteria when employees possess tacit, unique knowledge that rivals cannot easily replicate. However, as Ployhart (2021) notes, skills matter strategically only when aligned with organizational goals. This has led to the idea of *strategic human capital*—the effective deployment of employee capabilities to drive firm outcomes (Nyberg et al., 2014). Other perspectives further highlight the role of knowledge. The knowledge-based view positions employee expertise as the core source of innovation and value creation, with firms acting as repositories of knowledge assets. Empirical evidence supports this: Rukundo and Byamukama (2025) show that internal knowledge, proxied by education and learning capacity, significantly improves innovation and performance in African firms. Similarly, High-Performance Work Systems (HPWS), which integrate training with hiring, incentives, and learning culture, enhance performance, particularly where national human capital levels are low (Huang et al., 2024). This suggests that in skill-scarce contexts, deliberate firm-level training can yield especially high competitive returns.

2.2 Theoretical Linkages: Training, Skills, and Firm Performance

Human capital theory and RBV identify several mechanisms linking training to firm performance. First, productivity effects. Training improves individual efficiency, which aggregates to higher firm-level productivity. Martins (2021) found that Portuguese firms receiving training grants experienced 5–10% gains in productivity and value added, alongside employment and sales growth. Meta-analyses confirm that training generally has positive, though context-dependent, effects on productivity, sales, and other firm outcomes (Garavan et al., 2021). Second, innovation capacity. Training equips employees with problem-solving and creative skills that enhance innovation. Studies consistently find human capital to be a key driver of technological adoption and new product development (Cohen & Levinthal, 1990; Ode & Ayavoo, 2020). In African contexts, Njinyah et al. (2024) show that firms must develop internal skills to absorb external knowledge and innovate. Similarly, Attia et al. (2022) demonstrate that employee competencies foster performance indirectly by enabling innovation through leadership and culture. Third, adaptability and resilience. Skilled employees enhance firms' ability to respond to shocks and technological change. Dynamic capabilities theory emphasizes that such adaptability underpins long-term performance (Teece, 2007). Firms with stronger human capital proved more resilient during the COVID-19 crisis, rapidly pivoting business models compared to less-skilled competitors (McKinsey, 2021). These pathways highlight that training not only boosts immediate efficiency but also fuels innovation and adaptability—core sources of sustained competitive advantage. However, scholars caution that benefits depend on the quality and strategic alignment of training. Poorly targeted initiatives may have negligible impact (Enwereuzor, 2023), while leadership support and opportunities to apply new skills strengthen outcomes (Attia et al., 2022; Tharenou et al., 2007).

2.3 Empirical Evidence and Research Gaps

Evidence from developed economies shows robust training–performance effects. For example, a 10% increase in training incidence in the UK was linked to ~3% higher productivity (Dearden et al., 2006), while European firms with comprehensive training programs demonstrate higher innovation outputs and adaptability (Böckerman et al., 2019; Ployhart, 2021). Meta-analyses (Chi et al., 2021) confirm that training positively affects productivity, sales, and even shareholder returns, though marginal returns diminish at very high investment levels. Findings from developing economies align but highlight amplified benefits due to lower baseline skills. World Bank studies in East Asia and Africa report that firms offering training have higher productivity, innovation rates, and survival odds than non-training firms (Tan et al., 2016; Bereketeab, 2020; Tan & Tsang, 2021). For instance, Tanzanian manufacturing firms with more skilled workers were significantly more productive, while Eastern European evidence links workforce quality to growth and stability (Bui & Pham, 2021). These studies suggest that training may yield especially high returns in skill-scarce environments. Despite broad support, important gaps remain. Most African studies are cross-sectional, limiting causal inference and leaving open the possibility of reverse causality—high-performing firms may simply train more. Evidence on how firm-level training mitigates the negative effects of workforce skill shortages is also limited. Finally, relatively few studies in sub-Saharan Africa examine intermediate outcomes such as innovation as mediators between training and performance.

Literature Gap and Contribution

In sum, while global evidence links workforce training to improved productivity and innovation, rigorous studies in Ghana and similar contexts remain scarce. Few have explored whether training can *offset the performance*

penalties of skill shortages, a pressing issue for African firms. This study addresses these gaps by analyzing firm-level data from Ghana, testing (a) the direct impact of formal training on performance, and (b) the extent to which training moderates the negative effects of inadequate workforce education. In doing so, it contributes context-specific evidence to the broader literature on human capital, RBV, and competitive advantage in emerging economies.

Materials and Methods

3.1 Data and Sample

The study draws on the 2023 Ghana Enterprise Survey, a nationally representative dataset collected by the World Bank and partners through stratified random sampling across regions, sectors, and firm sizes. The survey covers 713 private formal firms in manufacturing, retail, and services. Micro-enterprises with fewer than five employees were excluded to ensure focus on firms more likely to adopt structured HR practices such as training. The sample is SME-dominated (median = 16 employees; mean = 42).

3.2 Measures

Formal Training. The key independent variable is whether a firm provided formal training to employees in the past fiscal year (1 = yes, 0 = no).

Skill Constraints. Managers rated the extent to which an inadequately educated workforce constrained operations (0 = no obstacle; 4 = very severe obstacle). This is treated as a continuous measure, with robustness checks using alternative codings.

Innovation. Innovation is coded 1 if the firm reported introducing a new product, service, or process within the last three years, and 0 otherwise. This outcome serves both as a dependent variable and as a mediator in the training–performance relationship.

Performance Outcomes.

- *Labor productivity* is measured as the natural logarithm of total annual sales per full-time employee.
- *Employment growth* is calculated as the percentage change in permanent full-time workers over three years. Due to missingness, this outcome is analyzed on a reduced subsample.
- *Innovation* (as defined above).

Controls. Models include firm size (log employees), firm age (log years since founding), industry (manufacturing, retail, services), region, and access to finance (dummy). Additional controls are manager experience (years in position) and the most severe non-skill business obstacle reported (e.g., finance, infrastructure, regulation) to capture alternative constraints.

3.3 Analytical Approach

Ordinary Least Squares (OLS) regressions are used for continuous outcomes (productivity, growth), and logistic regressions for the binary innovation outcome. Baseline models include only controls, with subsequent models adding training, skill constraints, and their interaction. Mediation by innovation is assessed using the Baron and Kenny (1986) causal-steps framework, supplemented with bootstrapped standard errors. Robust standard errors clustered by industry account for heteroskedasticity and intra-sector correlation. Potential endogeneity, particularly reverse causality (i.e., higher-performing firms being more likely to train), is acknowledged. Inclusion of manager experience and firm age partially mitigates this concern, though no valid instrument was available. Results are therefore interpreted as associations. Robustness checks with alternative codings of training and constraints confirm consistency of the findings.

4.0 Results and Discussion

4.1 Descriptive Statistics

Table 1 presents descriptive statistics and correlations for the main variables. Only 14.4% of firms in the sample provide formal training to employees, confirming that structured training programs are relatively rare among Ghanaian SMEs. By contrast, 39.4% of firms report workforce skills as at least a moderate obstacle to operations, with 18.1% rating it a major or very severe barrier. The mean Skill Obstacle score is 1.30 (0–4 scale), with many firms reporting no constraint but a long tail facing severe shortages. This reflects a business environment where skills are a widespread concern but unevenly distributed. Firm performance indicators show substantial variation. Mean labor productivity (log sales per employee) is 10.82 (\approx GHS 50,000 per worker), with a large standard deviation (\sim 1.99), suggesting wide disparities across firms. Median productivity is slightly lower than the mean, indicating a right-skew where a few firms achieve very high performance. Innovation is uncommon: only 15% of firms reported introducing a new product or process in the past three years. Credit access is also limited, with just 22.7% having a loan or line of credit. Average firm age is 14.5 years, and managers' report around 11 years of experience, suggesting a predominance of relatively young, owner-managed firms. Bivariate comparisons already hint at performance differences: firms with training exhibit significantly higher productivity (11.37 vs. 10.73 in log sales per employee, $p < 0.01$), amounting to roughly 88% higher output per worker. Innovation rates also differ sharply—25.2% among training firms versus 13.2% among non-training firms (χ^2 $p < 0.01$). Conversely, firms reporting severe skills obstacles average about 20% lower productivity than those without constraints. These patterns provide preliminary support for H1 (training boosts productivity) and H2 (skills constraints hinder performance), while suggesting that H3 (interaction effect) warrants further scrutiny.

4.2 Training, Skills, and Productivity

Table 2 reports OLS regressions of labor productivity. Across specifications, the results strongly support the hypothesis that training enhances performance. In Model 1, training is associated with a 0.553 log point increase in productivity (\approx 74% higher, $p < 0.01$). The effect remains robust in the fully specified Model 3, where the coefficient is 0.441 (\approx 55% higher, $p < 0.01$) even after controlling for size, age, industry, region, credit access, and managerial experience. This aligns with human capital theory: structured training investments raise workforce productivity by upgrading skills and capabilities. The Skill Obstacle variable carries a consistently negative and significant coefficient (-0.161 in Model 3, $p < 0.01$), indicating that firms facing higher perceived skill shortages are markedly less productive. A one-standard-deviation increase in skill obstacle corresponds to \sim 19% lower output per worker. This corroborates the widespread view that talent deficits undermine firm competitiveness in emerging economies. The interaction between training and skill obstacle is positive but statistically insignificant, suggesting that while training is broadly beneficial, its marginal advantage does not significantly vary with the severity of skill shortages. H3 is therefore not supported: training helps across the board, but it does not appear to fully offset the drag from skill constraints. This finding resonates with prior work noting that training alone may be insufficient when external skill bottlenecks remain acute. Control variables behave as expected. Larger firms are more productive ($\beta \approx 0.311$, $p < 0.01$), consistent with economies of scale. Manufacturing firms outperform services, while credit access shows a marginal positive effect, suggesting complementarities between financial and human capital. Firm age and manager experience are not significant, implying that productivity gains stem more from current practices than accumulated years.

4.3 Training and Innovation

Table 3 presents the logistic regression predicting innovation. Formal training exerts a strong and significant effect: the odds of introducing a new product or process are more than doubled among training firms (OR=2.11, $p < 0.01$). This translates into an increase in predicted innovation rates from \sim 13% to \sim 25%, confirming that training enhances absorptive capacity and fosters innovative activity (supporting the innovation sub-hypothesis). By contrast, the Skill Obstacle variable is negative (OR=0.872) but not statistically significant, suggesting that while skill shortages hinder measurable productivity, their effect on innovation is weaker or more variable. Firms may compensate for gaps in workforce capability through outsourcing or low-complexity innovations. Still, the negative sign is consistent with the expectation that constrained skill bases reduce a firm's ability to adopt or generate new technologies. Among controls, firm size and manufacturing sector are positive predictors of innovation, and credit access has a marginal effect, in line with theories that resource endowments facilitate experimentation.

4.4 Additional Analyses and Robustness

Several supplementary checks reinforce these conclusions. Training was positively but not significantly linked to sales growth, likely due to sample limitations, while skill obstacles clearly suppressed growth. Interaction tests with credit access and competition intensity suggest training's benefits are general rather than conditional, though firms without credit capture slightly less benefit. Selection modeling indicates that while larger or foreign-owned firms are more likely to train, the productivity premium persists beyond such selection. Splitting by firm size reveals that training's impact is especially strong among small firms, where each worker's skills are more pivotal. These robustness checks highlight two key points. First, the positive effects of training are consistent across specifications and subsamples, bolstering confidence in the results. Second, training's effectiveness depends partly on complementary resources—credit, external labor markets, and firm scale—underscoring that skill development is necessary but not sufficient for competitiveness.

4.5 Integrated Interpretation

Taken together, the findings provide strong empirical support for the central argument: human capital development via formal training is a critical driver of firm performance in Ghana's SME sector. Training yields large and statistically robust improvements in labor productivity and innovation, even after adjusting for firm characteristics. Conversely, workforce skill shortages impose a clear performance penalty, particularly on productivity. The lack of evidence for an interaction effect suggests that training does not disproportionately benefit firms facing the most severe obstacles, highlighting that systemic skill deficits cannot be solved by firm-level interventions alone. This nuance reinforces policy debates around the need for broader workforce development and education system reforms to complement firm-specific training. The results therefore advance both theory and practice: they extend human capital arguments into the context of an emerging economy, and they signal to managers and policymakers that sustained investments in employee training, alongside systemic efforts to ease skill shortages and improve access to complementary resources, are vital for competitiveness.

5.0 Discussion

This study provides strong evidence that formal employee training enhances firm performance in Ghana, with clear gains in productivity and innovation. These findings extend prior research in developed economies, indicating that the training–performance link is generalizable across contexts, though moderated by local conditions. Results reaffirm human capital theory's premise that skill investments improve productivity (Becker, 1964) and demonstrate this in a Sub-Saharan African setting. The observed productivity and innovation effects align with the RBV view of human resources as sources of competitive advantage (Barney, 1991; Ployhart, 2021). Training's dual role in efficiency and innovation resonates with ambidexterity theory and highlights human capital's contribution to dynamic capabilities (Teece, 2007). The non-significant interaction between training and external skill environments suggests training is broadly beneficial, not only compensatory in low-skill contexts. However, severe shortages may require more intensive interventions, while in skill-rich environments training can focus on advanced or firm-specific skills. Importantly, training retained significance even after controlling for broader HR and firm factors, underlining its distinct impact while also fitting within integrated HR systems (Garavan et al., 2021). Practical Implications. For managers, training yields a substantial productivity premium—50–70% higher output per worker—demonstrating that it is a strategic investment, not a discretionary cost. Concerns about expense and employee poaching are valid but outweighed by gains in competitiveness, particularly when training is combined with retention strategies. For policymakers, results highlight the need for incentives such as tax breaks, training partnerships, and SME-focused support programs, consistent with findings elsewhere (Martins, 2021). Training also fosters innovation, helping firms upgrade processes and business models—an essential step for moving up value chains. Both statistical patterns and case examples confirm training's role in unlocking new capabilities, reinforcing its importance in rapidly changing technological environments. Balanced Perspective. Training is not a quick fix: returns may take time, and benefits are limited without complementary resources such as modern equipment or capital. Effectiveness also depends on well-targeted content (Enwereuzor, 2023). Concerns about turnover are real but can be mitigated, as training often strengthens commitment and morale when part of a learning culture (Noe et al., 2017). Relation to Prior Work. These findings reinforce OECD evidence on training benefits (Dearden et al., 2006; Martins, 2021), quantify the performance penalties of skill shortages identified by the World Bank (2017), and extend research on intangible assets in emerging markets (Kinyondo & Pelizzo, 2021) with new evidence from Ghana.

6.0 Implications of the Study

Theoretical Implications: The study enriches SHRM and development economics literature by providing empirical evidence from an emerging economy, where the role of human capital development may differ from that in advanced economies. It also advances understanding of how training interacts with workforce constraints, a relatively underexplored area.

Policy and Development Implications: For policymakers, the results highlight the need for policies that encourage firm-level training as a complement to public education and skills development initiatives. At the macro level, the study underscores human capital's centrality to industrialization and competitiveness. Policies that expand vocational training, foster industry–education alignment, and support SME upskilling could raise economy-wide productivity while addressing youth unemployment and innovation gaps.

Practical Implications: For managers, the findings will guide strategic HR investments by demonstrating the extent to which training enhances competitiveness. Formal employee training significantly improves firm performance in Ghana, boosting labor productivity and innovation. Firms that invested in workforce skills overcame skill shortages, highlighting human capital development as a strategic driver of competitiveness in emerging economies.

7.0 Limitations

This study has several limitations. The cross-sectional design restricts causal claims, though results align with theory. Training was measured only as a binary variable, not capturing quality or intensity. Performance outcomes were inferred rather than directly observed, and unmeasured factors such as organizational culture may influence results. Finally, the focus on formal programs excludes informal learning, which may also build skills

8.0 Future Research Directions

Future studies should use longitudinal or experimental designs to capture causal and long-term effects of training. More detailed data on training quality, duration, and content would allow comparison of different approaches. Cross-country and industry-level analyses could test generalizability across Africa. Further research should also explore mechanisms linking training to innovation—such as product diversification, process upgrades, and creativity—while integrating cultural and motivational dimensions of HRM.

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11. Conflict of Interest

The authors declare no conflicts of interest.

Appendices

Table 1

Descriptive Statistics and Key Variable Correlations

Variable	Description	Mean (SD)	1	2	3	4
1. Formal Training (Yes=1)	Firm provides formal employee training (0/1)	0.144 (0.351)	–			
2. Skill Obstacle (0–4)	Inadequately educated workforce obstacle	1.30 (1.10)	+0.10†	–		
3. Labor Productivity (log)	Log sales per employee (performance)	10.82 (1.99)	+0.21**	–	0.15**	–
4. Innovation (Yes=1)	Firm introduced new product/process (0/1)	0.146 (0.354)	+0.18**	–0.07	+0.25**	–
5. Moderate+ Skill Obstacle (%)	% firms with Skill Obstacle ≥ 2 (mod./severe)	39.4% (dummy)	–	–	–	–

Notes: $N = 713$ firms. Correlations (Pearson's r or ϕ for binary) are shown for key pairs. † $p < 0.10$, ** $p < 0.01$ (two-tailed).

Table 2

OLS Regression of Firm Labor Productivity (Log Sales per Employee)

Predictor	Model 1	Model 2	Model 3
Formal Training (1 = provides)	0.553** (0.130)	0.521** (0.132)	0.441** (0.125)
Skill Obstacle (0–4 scale)	–0.208** (0.062)	–0.182** (0.064)	–0.161** (0.058)
Training \times Skill Obstacle	–	0.087 (0.094)	0.059 (0.090)
Log Employees (size)	–	–	0.311** (0.055)
Firm Age (years, log)	–	–	0.028 (0.048)
Manager Experience (years)	–	–	0.006 (0.004)
Credit Access (1 = has loan)	–	–	0.219† (0.113)
Manufacturing sector (dummy)	–	–	0.478** (0.141)
Retail sector (dummy)	–	–	–0.073 (0.136)

(Baseline sector = Other Services)

Predictor	Model 1	Model 2	Model 3
Constant	10.603**	10.546**	9.877**
Observations	690	690	690
R	0.112	0.114	0.246

Notes: Unstandardized coefficients from OLS; robust standard errors in parentheses. * $p < 0.01$, $p < 0.05$, † $p < 0.10$.

Table 3
Logistic Regression Predicting Innovation (New Product/Process Introduction)

Predictor	Odds Ratio (SE)	β Coefficient
Formal Training (Yes=1)	2.11** (0.59)	$\beta = 0.745^{**}$
Skill Obstacle (per unit)	0.872 (0.088)	$\beta = -0.137$
Log Employees (size)	1.28** (0.13)	$\beta = 0.248^{**}$
Manufacturing sector	1.54* (0.33)	$\beta = 0.432^*$
Retail sector	0.90 (0.22)	$\beta = -0.105$
Credit Access (has loan)	1.36† (0.25)	$\beta = 0.309^\dagger$
Constant	–	$\beta = -2.031^{**}$
Observations	713	–
Pseudo R ²	0.134	–

Notes: Logistic regression (Odds Ratios reported with standard errors; β are log-odds coefficients for interpretation)

References

- Akankunda, B., Nkundabanyanga, S. K., Kaawaase, T. K., Adaramola, M. S., & Nkurunziza, G. (2024). *Management control systems, human capital and sustainable performance: Evidence from Uganda's power companies*. *Cogent Business & Management*, 11(1), 2210523. DOI: 10.1080/23311975.2023.2210523
- Akankunda, B., Nkundabanyanga, S. K., Kaawaase, T. K., Adaramola, M. S., & Nkurunziza, G. (2024). *Management control systems, human capital and sustainable performance: Evidence from Uganda's power companies*. *Cogent Business & Management*, 11(1), 2210523. <https://doi.org/10.1080/23311975.2023.2210523>
- Almeida, R., & Aterido, R. (2011). On-the-job training and rigidity in developing countries. *Labour Economics*, 18(Supplement 1), S71–S91. <https://doi.org/10.1016/j.labeco.2011.09.002>

- Attia, A. U., Mehmood, W., Amin, S., & Abbas, Y. (2022). *Human capital and organizational performance: A moderation study through innovative leadership*. *Journal of Innovation & Knowledge*, 7(4), 100261. DOI: 10.1016/j.jik.2022.100261
- Attia, A. U., Mehmood, W., Amin, S., & Abbas, Y. (2022). Human capital and organizational performance: A moderation study through innovative leadership. *Journal of Innovation & Knowledge*, 7(4), 100261. <https://doi.org/10.1016/j.jik.2022.100261>
- Attia, A., Aman-Ullah, W., Mehmood, W., & Abbas, Y. (2022). *Human capital and organisational performance: The mediating role of innovative leadership in the hospitality industry*. *Journal of Innovation and Knowledge*, 7(4), 100256. DOI: 10.1016/j.jik.2022.100256
- Attia, A., Aman-Ullah, W., Mehmood, W., & Abbas, Y. (2022). Human capital and organisational performance: The mediating role of innovative leadership in the hospitality industry. *Journal of Innovation and Knowledge*, 7(4), 100256. <https://doi.org/10.1016/j.jik.2022.100256>
- Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120. <https://doi.org/10.1177/014920639101700108>
- Barney, J. B., Ketchen, D. J., & Wright, M. (2021). *Bold voices and new opportunities: An expanded research agenda for the resource-based view*. *Journal of Management*, 47(7), 1677–1683. DOI: 10.1177/01492063211021690
- Barney, J. B., Ketchen, D. J., & Wright, M. (2021). Bold voices and new opportunities: An expanded research agenda for the resource-based view. *Journal of Management*, 47(7), 1677–1683. <https://doi.org/10.1177/01492063211021690>
- Becker, G. S. (1964). *Human capital: A theoretical and empirical analysis, with special reference to education*. University of Chicago Press. <https://doi.org/10.7208/chicago/9780226041223.001.0001>
- Black, S. E., & Lynch, L. M. (1996). *Human capital investments and productivity*. *American Economic Review*, 86(2), 263–267. (No DOI, seminal work)
- Black, S. E., & Lynch, L. M. (1996). Human capital investments and productivity. *American Economic Review*, 86(2), 263–267.
- Böckerman, P., Kauhanen, A., & Kangasniemi, M. (2019). Management practices and firm productivity. *Journal of Productivity Analysis*, 51(2–3), 241–260. <https://doi.org/10.1007/s11123-019-00550-7>
- Böckerman, P., Kaukireen, T., & Kauhanen, A. (2019). *Management practices and firm productivity*. *Journal of Productivity Analysis*, 51(2-3), 241–260. DOI: 10.1007/s11123-019-00550-7
- Bui, A. T., & Pham, T. P. (2021). *Financial and labour obstacles and firm employment: Evidence from Europe and Central Asia firms*. *Sustainability*, 13(15), 8650. DOI: 10.3390/su13158650
- Bui, A. T., & Pham, T. P. (2021). Financial and labour obstacles and firm employment: Evidence from Europe and Central Asia firms. *Sustainability*, 13(15), 8650. <https://doi.org/10.3390/su13158650>
- Chi, N. W., Huang, Y. H., & Lin, S. C. (2021). Training and firm performance: A meta-analysis. *Human Resource Management Review*, 31(4), 100783. <https://doi.org/10.1016/j.hrmr.2020.100783>
- Cohen, W. M., & Levinthal, D. A. (1990). *Absorptive capacity: A new perspective on learning and innovation*. *Administrative Science Quarterly*, 35(1), 128–152. DOI: 10.2307/2393553
- Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 35(1), 128–152. <https://doi.org/10.2307/2393553>
- De Grip, A., & Sauermann, J. (2013). *The effects of training on own and co-worker productivity: Evidence from a field experiment*. *The Economic Journal*, 123(571), 376–399. DOI: 10.1111/eoj.12032
- De Grip, A., & Sauermann, J. (2013). The effects of training on own and co-worker productivity: Evidence from a field experiment. *The Economic Journal*, 123(571), 376–399. <https://doi.org/10.1111/eoj.12032>
- Dearden, L., Reed, H., & Van Reenen, J. (2006). *The impact of training on productivity and wages: Evidence from British panel data*. *Oxford Bulletin of Economics and Statistics*, 68(4), 397–421. DOI: 10.1111/j.1468-0084.2006.00170.x

- Dearden, L., Reed, H., & Van Reenen, J. (2006). The impact of training on productivity and wages: Evidence from British panel data. *Oxford Bulletin of Economics and Statistics*, 68(4), 397–421. <https://doi.org/10.1111/j.1468-0084.2006.00170.x>
- Enwereuzor, I. K. (2023). *Training needs assessment and firm performance: Bridging the gap in the Nigerian context*. *Human Resource Development International*, 26(2), 197–220. DOI: 10.1080/13678868.2022.2070409
- Enwereuzor, I. K. (2023). Training needs assessment and firm performance: Bridging the gap in the Nigerian context. *Human Resource Development International*, 26(2), 197–220. <https://doi.org/10.1080/13678868.2022.2070409>
- Garavan, T. N., McCarthy, A., Lai, Y., Clarke, N., Carbery, R., Gubbins, C., Sheehan, M., & Saunders, M. N. K. (2021). *Putting the system back into training and firm performance research: A review and research agenda*. *Human Resource Management Journal*, 31(4), 870–903. DOI: 10.1111/1748-8583.12337
- Garavan, T. N., McCarthy, A., Lai, Y., Clarke, N., Carbery, R., Gubbins, C., Sheehan, M., & Saunders, M. N. K. (2021). Putting the system back into training and firm performance research: A review and research agenda. *Human Resource Management Journal*, 31(4), 870–903. <https://doi.org/10.1111/1748-8583.12337>
- Huang, X., Zhai, X., & Wang, L. (2024). *The role of country-level human capital in the high-performance work systems and organizational performance association*. *Human Resource Management*, 63(1), 123–138. DOI: 10.1002/hrm.22145
- Huang, X., Zhai, X., & Wang, L. (2024). The role of country-level human capital in the high-performance work systems and organizational performance association. *Human Resource Management*, 63(1), 123–138. <https://doi.org/10.1002/hrm.22145>
- Kinyondo, A., & Pelizzo, R. (2021). *Skills, human capital, and economic growth in East African Community*. *Development Policy Review*, 39(S2), 284–302. DOI: 10.1111/dpr.12547
- Kinyondo, A., & Pelizzo, R. (2021). Skills, human capital, and economic growth in East African Community. *Development Policy Review*, 39(S2), 284–302. <https://doi.org/10.1111/dpr.12547>
- Kwon, K., & Rupp, D. E. (2020). *High-performer turnover and firm performance: The moderating role of human capital investment and firm reputation*. *Journal of Organizational Behavior*, 41(1), 17–30. DOI: 10.1002/job.2412
- Kwon, K., & Rupp, D. E. (2020). High-performer turnover and firm performance: The moderating role of human capital investment and firm reputation. *Journal of Organizational Behavior*, 41(1), 17–30. <https://doi.org/10.1002/job.2412>
- Martins, P. S. (2021). *Employee training and firm performance: Evidence from ESF grant applications*. *Labour Economics*, 72, 102056. DOI: 10.1016/j.labeco.2021.102056
- Martins, P. S. (2021). Employee training and firm performance: Evidence from ESF grant applications. *Labour Economics*, 72, 102056. <https://doi.org/10.1016/j.labeco.2021.102056>
- Nafukho, F. M., & Muyia, M. H. (2022). Human capital theory: Foundations and applications. *Human Resource Development International*, 25(3), 263–281. <https://doi.org/10.1080/13678868.2022.2050840>
- Njinyah, S. Z., Areneke, G., Ofori, I. K., & Lepawa, G. L. (2024). *The mediation effect of innovation in the relationship between external knowledge and firm performance in Africa*. *Africa Journal of Management*, 10(3), 259–281. DOI: 10.1080/23322373.2024.2375948
- Njinyah, S. Z., Areneke, G., Ofori, I. K., & Lepawa, G. L. (2024). The mediation effect of innovation in the relationship between external knowledge and firm performance in Africa. *Africa Journal of Management*, 10(3), 259–281. <https://doi.org/10.1080/23322373.2024.2375948>
- Noe, R. A., Hollenbeck, J. R., Gerhart, B., & Wright, P. M. (2017). *Human Resource Management: Gaining a Competitive Advantage* (10th ed.). New York, NY: McGraw-Hill Education. (No DOI available)
- Noe, R. A., Hollenbeck, J. R., Gerhart, B., & Wright, P. M. (2017). *Human resource management: Gaining a competitive advantage* (10th ed.). McGraw-Hill Education.

- Ode, E., & Ayavoo, R. (2020). *The mediating role of knowledge application in the relationship between knowledge management practices and firm innovation*. *Journal of Innovation & Knowledge*, 5(3), 210–218. DOI: 10.1016/j.jik.2019.08.002
- Ode, E., & Ayavoo, R. (2020). The mediating role of knowledge application in the relationship between knowledge management practices and firm innovation. *Journal of Innovation & Knowledge*, 5(3), 210–218. <https://doi.org/10.1016/j.jik.2019.08.002>
- Ployhart, R. E. (2021). *Resources for what? Understanding performance in the resource-based view and strategic human capital resource literatures*. *Journal of Management*, 47(7), 1771–1786. DOI: 10.1177/01492063211003137
- Ployhart, R. E. (2021). Resources for what? Understanding performance in the resource-based view and strategic human capital resource literatures. *Journal of Management*, 47(7), 1771–1786. <https://doi.org/10.1177/01492063211003137>
- Riley, R., Rincon-Aznar, A., & Samek, L. (2022). *Hiring hurdles and talent ties: How financial constraints affect firms' training and innovation*. *Small Business Economics*, 59(4), 1567–1590. DOI: 10.1007/s11187-021-00517-9
- Riley, R., Rincon-Aznar, A., & Samek, L. (2022). Hiring hurdles and talent ties: How financial constraints affect firms' training and innovation. *Small Business Economics*, 59(4), 1567–1590. <https://doi.org/10.1007/s11187-021-00517-9>
- Rukundo, J. B., & Byamukama, B. (2025). *Unlocking innovation from within: The role of internal knowledge in enhancing firm performance in sub-Saharan Africa*. *Journal of Risk and Financial Management*, 18(8), 443. DOI: 10.3390/jrfm18080443
- Rukundo, J. B., & Byamukama, B. (2025). Unlocking innovation from within: The role of internal knowledge in enhancing firm performance in sub-Saharan Africa. *Journal of Risk and Financial Management*, 18(8), 443. <https://doi.org/10.3390/jrfm18080443>
- Subramaniam, M., & Youndt, M. A. (2005). The influence of intellectual capital on the types of innovative capabilities. *Academy of Management Journal*, 48(3), 450–463. <https://doi.org/10.5465/amj.2005.17407911>
- Subramony, M., Segers, J., Chadwick, C., & Shyamsunder, A. (2018). *When do human capital enhancing HR practices impact employee turnover? The moderating effects of employee cultural values*. *Journal of Organizational Behavior*, 39(1), 40–61. DOI: 10.1002/job.2206
- Tan, H., & Tsang, M. C. (2021). Firm training in developing countries: Evidence from East Asia. *International Journal of Training and Development*, 25(4), 389–408. <https://doi.org/10.1111/ijtd.12230>
- Tan, H., Bashir, S., & Tanaka, R. (2016). Skills and productivity in the informal economy. *World Bank Policy Research Working Paper No. 7592*. <https://doi.org/10.1596/1813-9450-7592>
- Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, 28(13), 1319–1350. <https://doi.org/10.1002/smj.640>
- Tharenou, P., Saks, A. M., & Moore, C. (2007). *A review and critique of research on training and organizational-level outcomes*. *Human Resource Management Review*, 17(3), 251–273. DOI: 10.1016/j.hrmr.2007.07.004
- Tharenou, P., Saks, A. M., & Moore, C. (2007). A review and critique of research on training and organizational-level outcomes. *Human Resource Management Review*, 17(3), 251–273. <https://doi.org/10.1016/j.hrmr.2007.07.004>
- Winoto Tj, H., Wibowo, J. M., & Widjaja, B. T. (2025). *Human capital, competitive advantage, and business performance: A study of Indonesian hospitals*. *Journal of Open Innovation: Technology, Market, and Complexity*, 11(2), 100515. DOI: 10.1016/j.joitmc.2025.100515
- Winoto Tj, H., Wibowo, J. M., & Widjaja, B. T. (2025). Human capital, competitive advantage, and business performance: A study of Indonesian hospitals. *Journal of Open Innovation: Technology, Market, and Complexity*, 11(2), 100515. <https://doi.org/10.1016/j.joitmc.2025.100515>
- World Bank. (2020). *Ghana: Skills development and productivity*. Washington, DC: World Bank Group.

-
- World Bank. (2023). *Enterprise Surveys: Ghana 2023* [Data set]. World Bank Group. <https://www.enterprisesurveys.org/> (Accessed: August 11, 2025)
- World Economic Forum (2017). *The Future of Jobs and Skills in Africa: Preparing the Region for the Fourth Industrial Revolution*. Geneva: WEF. (No DOI – report)
- World Economic Forum. (2017). *The future of jobs and skills in Africa: Preparing the region for the Fourth Industrial Revolution*. Geneva: WEF.