Bridging the Gap Between HR Strategy and Employee Performance: A Study of TNA Practices in Public and Private Universities in Sindh

Dr Saima Tabassum, PhD
Associate Professor, Institute of Business Administration (IBA), University of Sindh, Jamshoro, Pakistan
saima.tabassum@usindh.edu.pk

Imdad Hussain Siddiqui, MS
PhD Scholar, Institute of Business Administration (IBA), UoS, Pakistan.
is.mpa.hr@gmail.com

Dharmoon Bhawani,
Master in Public Policy,Monash University, Australia Research Scholar
bhawanidharmoon@gmail.com

Muhammad Zaman, MBA
Corporate Banking, Bank Al Habib Limited – Islamic Banking Karachi, Pakistan
muhammad.zaman2712@gmail.com

Abstract

This study explores the institutional role of training in enhancing human productivity, with a comparative focus on public and private sector universities in Sindh, Pakistan. Using a quantitative approach, data were collected from 400 academic and administrative staff members through a structured questionnaire. The conceptual framework was developed around four independent variables: Institutional Factors, Training & Development, Employee-Related Factors, and Demographic & Contextual Factors, all evaluated against the dependent variable—Human Productivity.

Descriptive statistics revealed overall dissatisfaction with institutional support, training programs, and motivational systems. Regression analysis confirmed that all four factors significantly influence productivity, with Employee-Related Factors emerging as the strongest predictor. The model explained 68.2% of the variance in productivity ($R^2 = .682$). Additionally, moderation analysis showed that gender significantly affects the training-productivity relationship, highlighting the need for inclusive development policies.

The findings underscore the need for structured training programs, transparent institutional policies, and motivation-enhancing HR practices to improve productivity outcomes. The study contributes valuable insights for policymakers, HR managers, and academic leaders seeking to build effective strategies for sustainable workforce development in the higher education sector.

Keywords: *Human Productivity, Training, Institutional Factors, Higher Education*

Introduction

In the knowledge-driven global economy of the 21st century, higher education institutions are considered the engines of intellectual and socio-economic development. As the demand for skilled professionals grows, universities are under increasing pressure to produce a workforce that is not only academically competent but also practically equipped to meet industry and societal expectations. This paradigm shift has placed significant emphasis on staff training and development, not just for teaching faculty but also for non-teaching employees, whose collective efforts shape the academic environment and institutional performance.

Training, as an organized learning activity, has long been recognized as a key contributor to employee productivity and institutional success. Numerous studies affirm that well-structured training programs enhance employee motivation, efficiency, commitment, and job satisfaction—factors essential for achieving long-term institutional goals (Farooq & Khan, 2011; Olaniyan & Ojo, 2008). In the context of higher education, training becomes even more critical, given the dynamic and evolving nature of teaching methodologies, administrative processes, technological advancements, and student expectations.

Pakistan's higher education sector faces numerous challenges—ranging from underqualified teaching staff and unskilled non-teaching personnel to a lack of robust professional development frameworks (World Bank, 2000; Memon, 2007). These issues are exacerbated by budgetary constraints, resistance to change, and inconsistent institutional policies. As a result, many public and private universities struggle to meet both national and international standards of education and quality assurance. The Higher Education Commission (HEC) of Pakistan and the Vision 2025 policy framework have repeatedly emphasized the need for human capital development through strategic investments in training, innovation, and skill enhancement (Planning Commission, 2014).

This research explores the dynamics of training and its institutional role for enhancing human productivity, with a specific focus on public and private sector universities in Sindh. It investigates how training interventions influence employee performance, motivation, and

institutional strengthening. Furthermore, it compares training practices, participation levels, and the effectiveness of training programs across both sectors, revealing systemic strengths and weaknesses.

Historically, training in Pakistani universities has often been perceived as an administrative formality rather than a strategic initiative. Despite being mandated in various policies, structured and recurring training programs are either inadequately planned or poorly executed. Training Need Assessment (TNA)—a crucial first step in the training cycle—is rarely implemented comprehensively, leading to generic training sessions that fail to address the actual skill gaps of employees (Naseer, 2011). According to Syed (2011), this lack of strategic alignment between institutional objectives and training outcomes results in a waste of resources and negligible impact on employee performance.

Studies suggest that on-the-job training methods—such as mentoring, internships, and job rotations—are among the most effective in higher education contexts, as they promote real-time skill acquisition and practical learning. In contrast, off-the-job methods like workshops and seminars often suffer from low retention rates unless followed by post-training reinforcement or practical application opportunities (Kayani & Aziz, 2014). E-learning and digital training platforms are also gaining traction, but infrastructural and technological limitations—especially in public universities—continue to hinder their adoption (Hameed Ullah, 2011). Nevertheless, private universities in Sindh have shown greater adaptability and investment in modern training models, often outsourcing training to specialized firms and allocating separate budgets for faculty and staff development.

The effectiveness of training also hinges on the organizational climate. An environment that fosters continuous learning, recognizes employee achievements, and integrates training outcomes into performance evaluations is more likely to witness tangible gains in productivity. Unfortunately, many Pakistani universities lack a systematic approach to training evaluation. Institutions seldom apply models like Kirkpatrick's four-level evaluation or ROI analysis, resulting in an inability to assess training impact meaningfully (Akhila, 2011). Without feedback

loops and measurable outcomes, it becomes difficult to improve training content, methodology, and delivery mechanisms.

Another key concern is employee motivation and behavior, which are critical mediators in the training-productivity link. When employees perceive training as relevant, empowering, and rewarding, their commitment and job involvement increase significantly. Motivation theories—such as Vroom's Expectancy Theory and Herzberg's Two-Factor Theory—reinforce the idea that intrinsic and extrinsic motivators directly influence work performance (Raymond, 1986). Empirical evidence from this study shows that a majority of both public and private sector respondents believe that training enhances their job satisfaction, confidence, and sense of organizational belonging.

Gender inclusivity and equity in training also surfaced as important themes in the current research. While private universities are relatively proactive in promoting inclusive training practices, public institutions still show signs of disparity in training access for women, minorities, and senior employees. Furthermore, resistance to new teaching technologies and methods is more pronounced among senior faculty, especially in the public sector, highlighting the need for targeted change management strategies.

The study's findings underscore the necessity of adopting a comprehensive framework that encompasses all phases of the training cycle—from needs assessment to evaluation and reinforcement. Such a framework must be adaptable, cost-effective, and aligned with institutional goals. The proposed framework in this study emphasizes continuous learning, interdepartmental collaboration, and feedback integration. By adopting this model, universities can systematically improve employee skills, reduce absenteeism and turnover, and ultimately enhance institutional performance and reputation.

In conclusion, training is not merely a support function but a strategic driver of institutional excellence. Its impact on human productivity is profound and multifaceted, affecting not only individual performance but also organizational culture and service delivery. For Pakistani universities striving to compete on a global platform and contribute to national development, investing in training is no longer optional—it is imperative.

Research Gap

Although extensive literature exists on the role of training in enhancing employee performance across sectors, there remains a significant lack of empirical studies specifically focused on Pakistani higher education institutions, particularly in the Sindh province. Most available research addresses general training impacts on individual behavior or organizational outcomes but fails to deeply explore the internal and external factors that influence human productivity within universities.

Additionally, the comparative perspective between public and private sector universities is underexplored. Studies seldom differentiate the productivity influencers unique to each sector, despite their distinct administrative structures, policy frameworks, and resource availability. Moreover, there is limited scholarly focus on how non-training-related factors—such as job environment, leadership style, communication flow, workload, and motivation—affect productivity in academic settings.

There is also a methodological gap: few studies integrate a multi-variable model that combines both qualitative and quantitative factors influencing productivity beyond training. Without such comprehensive frameworks, universities cannot strategically address root causes of low productivity or tailor interventions effectively.

This research seeks to fill these gaps by not only measuring the impact of training but also identifying and analyzing the key drivers and barriers of productivity across university staff in different institutional settings.

Main Objective:

"To identify and analyze factors that increase or decrease human productivity in university employees."

Sub-Objectives Derived from Main Objective

1. To identify institutional factors (e.g., policies, leadership, communication) that influence human productivity in public and private universities.

2. To examine employee-related factors (e.g., motivation, commitment, skill level, workload) that contribute to productivity variations.
3. To compare the impact of external factors (e.g., technological infrastructure, job market conditions) on productivity between public and private university employees.
4. To analyze the relationship between job satisfaction and productivity outcomes in academic and administrative staff.
5. To explore sectoral differences in productivity determinants based on university ownership (public vs. private).
6. To assess how gender, age, experience, and job designation influence perceived productivity levels among university employees.

Literature Review

Factors Influencing Human Productivity in University Employees

Human productivity within higher education institutions is a multifaceted construct influenced by a myriad of factors ranging from institutional policies to individual employee characteristics. Universities, as centers of knowledge creation and dissemination, rely heavily on the productivity of their academic and administrative staff to achieve their educational and research objectives. Understanding the determinants of productivity in this context is crucial for formulating effective strategies to enhance performance and institutional effectiveness.

Institutional Factors Affecting Productivity

Institutional factors play a pivotal role in shaping the work environment and, consequently, the productivity of university employees. These factors include organizational culture, leadership styles, resource availability, and policy frameworks.

Leadership style is a significant determinant of employee productivity. Transformational leadership, characterized by inspiration and intellectual stimulation, has been positively associated with increased employee engagement and productivity (Abdelwahed & Al Doghan,

2023). Conversely, transactional leadership, which focuses on routine and supervision, may not foster the same level of motivation among staff.

Resource availability, including access to research funding, teaching materials, and technological tools, directly impacts the ability of staff to perform their duties effectively. A study by Batool et al. (2018) highlighted that inadequate resources in public universities in Pakistan led to decreased research productivity among faculty members.

Organizational culture that promotes collaboration, innovation, and continuous learning contributes to higher productivity levels. Institutions that encourage open communication and provide opportunities for professional development create an environment conducive to employee growth and performance (Aldoghan & Abdelwahed, 2023).

Individual Factors Influencing Productivity

Individual characteristics such as motivation, job satisfaction, and personal competencies significantly affect productivity. Self-determination theory posits that intrinsic motivation, driven by autonomy, competence, and relatedness, enhances employee engagement and performance (Rietveld et al., 2022).

Job satisfaction is closely linked to productivity. Employees who find their work meaningful and feel valued by their institution are more likely to exhibit higher levels of commitment and output. Factors contributing to job satisfaction include recognition, career advancement opportunities, and a supportive work environment (Abdelwahed & Al Doghan, 2023).

Personal competencies, including time management, adaptability, and communication skills, also influence productivity. Employees who continuously develop these skills are better equipped to handle the dynamic challenges of the academic environment (Nguyen, 2015).

Comparative Analysis: Public vs. Private Universities

The distinction between public and private universities often leads to differences in productivity determinants. Private universities, typically characterized by more flexible administrative structures and better resource allocation, may provide a more conducive environment for

productivity. In contrast, public universities may face bureaucratic hurdles and resource constraints that hinder employee performance (Aziz et al., 2014).

A study by Wankhede and Rajeshree (2014) found that private universities in India exhibited higher levels of faculty productivity due to better infrastructure and performance-based incentives. Similarly, in Pakistan, private institutions often offer more competitive salaries and professional development opportunities, contributing to enhanced staff performance (Memon, 2007).

The Role of Training and Development

Training and development programs are instrumental in enhancing employee productivity. Effective training equips staff with the necessary skills and knowledge to perform their roles efficiently. Moreover, continuous professional development fosters a culture of lifelong learning and adaptability.

Aldoghan and Abdelwahed (2023) emphasized the importance of work engagement and organizational support in training initiatives. Their study demonstrated that training programs aligned with organizational goals and employee needs lead to improved performance and productivity.

However, the effectiveness of training programs depends on their relevance, delivery methods, and follow-up mechanisms. Institutions must conduct thorough training needs assessments to ensure that programs address actual skill gaps and contribute to organizational objectives (Naseer, 2011).

Demographic and Contextual Variables

Demographic factors such as age, gender, and years of experience can influence productivity. For instance, younger faculty members may be more adaptable to technological advancements, while experienced staff bring valuable institutional knowledge. Gender dynamics also play a role, with studies indicating that female faculty often face additional challenges in balancing work and personal responsibilities, potentially affecting their productivity (Owence, 2014).

Contextual variables, including institutional policies and societal norms, further impact productivity. In regions where higher education is underfunded or undervalued, staff may lack motivation due to limited career progression opportunities and inadequate recognition (Memon, 2007).

Behavioral and Attitudinal Factors

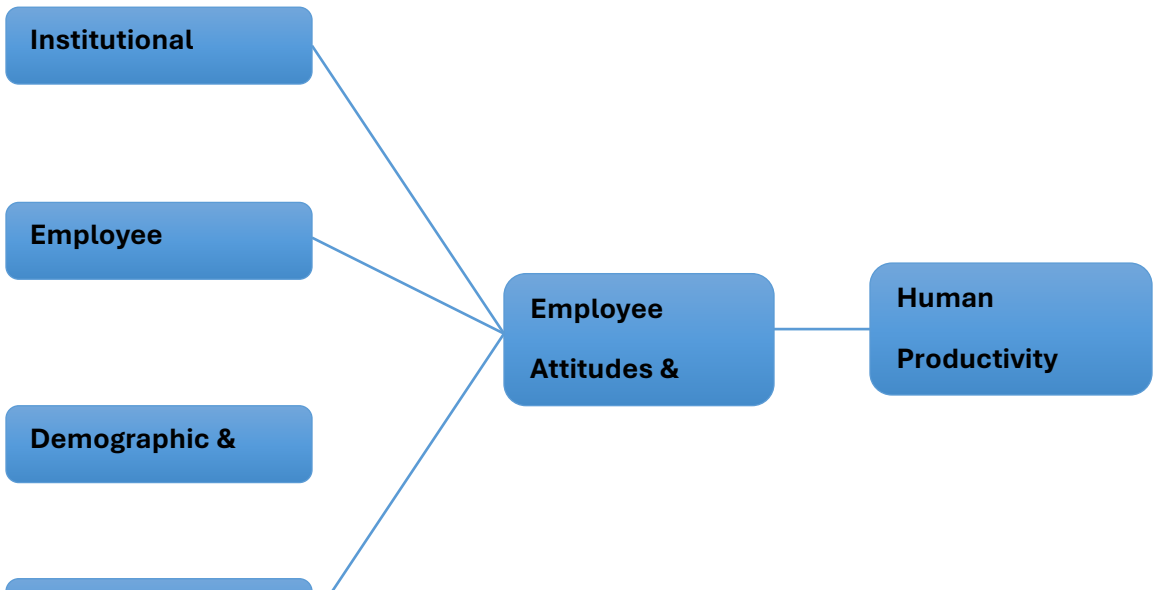
Employee attitudes towards their work and institution significantly affect productivity. Positive attitudes, characterized by enthusiasm and commitment, enhance performance, while negative attitudes can lead to disengagement and reduced output. Organizational commitment, defined as the psychological attachment of employees to their institution, is a critical predictor of productivity (Blau & Boal, 1987).

Moreover, employees' perceptions of fairness and equity within the institution influence their motivation and performance. Institutions that promote transparency and equitable treatment are more likely to foster a productive workforce (Raymond & Schmitt, 1986).

Technological Advancements and Productivity

The integration of technology in higher education has transformed teaching, research, and administrative processes. Technological tools facilitate efficient communication, data management, and access to information, thereby enhancing productivity. However, the successful implementation of technology requires adequate training and support to ensure that staff can effectively utilize these tools (Hameed Ullah, 2011).

Figure 1
Conceptual Framework: Factors Influencing Human Productivity



Research Hypothesis

H1: *Leadership and institutional policies have a statistically significant impact on employee productivity in public and private sector universities of Sindh.*

H2: *Job motivation significantly influences the productivity levels of university employees.*

H3: *There is a significant difference in productivity levels between employees of public and private sector universities.*

H4: *Access to training and Training Needs Assessment (TNA) significantly improves employee productivity.*

H5: *Employees' perception of training relevance significantly affects their productivity outcomes.*

Research Methods

This study aimed to investigate the factors influencing human productivity in university employees using a quantitative, descriptive, and comparative research design. The target population consisted of academic and non-academic staff from selected public and private universities in Sindh, Pakistan. A cross-sectional survey was used as the primary data collection strategy, with 400 respondents from both sectors. The data was collected through a structured questionnaire, divided into five sections: demographic information, institutional factors, employee-related factors, training & development, and productivity measures. The instrument's reliability was verified using Cronbach's Alpha, which exceeded 0.7 for all key constructs,

indicating internal consistency.

The data was collected through permission from university authorities and anonymity and confidentiality were assured to all participants. The questionnaires were distributed physically and electronically, yielding 340 valid responses used for final analysis. Data analysis techniques included descriptive statistics for demographic analysis, independent sample t-tests to compare productivity levels between public and private universities, Pearson's correlation coefficients to examine relationships between variables, multiple regression analysis to determine the predictive strength of institutional, employee-related, and training factors on productivity, one-sample t-tests to validate specific hypotheses with benchmark means.

The research adhered to standard ethical protocols, with respondents informed of their voluntary participation and the use of their responses strictly for academic purposes. Data was anonymized and stored securely to protect privacy.

Data Analysis

Descriptive Statistics

Table 1
Gender Distribution by Sector

Sector	Male (n/%)	Female (n/%)	Total (n/%)
Public	100 (50%)	100 (50%)	200 (100%)
Private	99 (49.5%)	101 (50.5%)	200 (100%)
Total	199 (49.75%)	201 (50.25%)	400 (100%)

Interpretation: Gender representation is balanced across both sectors, which enhances the reliability of gender-related productivity analysis.

Table 2
Descriptive Statistics for Conceptual Framework Variables

Variable	N	Mean	Std. Deviation	Significance Level	Critical Value	Test Statistic	p-value
Institutional Factors	200	1.50	0.673	0.05	-1.653	-31.544	.00000
Training & Development	200	1.58	0.711	0.05	-1.653	-28.227	.00000
Employee-Related Factors	200	1.59	0.620	0.05	-1.653	-32.186	.00000
Demographic & Contextual Factors	200	2.64	1.191	0.05	-1.653	-4.276	.00000

Table 2 summarizes descriptive statistics for all four independent variables influencing employee productivity in higher education settings. The mean scores for Institutional Factors (1.50), Training & Development (1.58), and Employee-Related Factors (1.59) are all well below the neutral point of 3 on a 5-point Likert scale. This indicates a strong trend of dissatisfaction or perceived inadequacy in these areas across the sampled university employees. Standard deviations for these variables were relatively low (ranging from 0.620 to 0.711), reflecting consistency in participant responses.

For Demographic & Contextual Factors, the mean score of 2.64 is higher than the others, suggesting more neutral or mixed perceptions, though still indicating a generally negative or less confident sentiment. The standard deviation for this variable was 1.191, the highest among all, highlighting more variation in how respondents perceive demographic and context-based challenges.

All variables yielded highly significant test statistics ($p < .001$), except Demographic & Contextual Factors, which still showed statistical significance with $p = .000014$. These results validate the assumption that all four independent variables significantly diverge from neutral perceptions and play a crucial role in shaping employee productivity outcomes.

The findings reinforce the conceptual argument that employee productivity is closely linked to institutional support systems, access to training, motivational alignment, and contextual

considerations. Interventions aimed at improving these areas are likely to yield positive outcomes in organizational performance.

Table 3
Correlation Matrix of Key Variables

This table outlines Pearson correlation coefficients between conceptual framework variables:

Variables	IF	TD	ERF	DCF	HP
Institutional Factors (IF)	1	.66	.55	.52	.71
Training & Development (TD)	.66	1	.47	.46	.72
Employee-Related Factors (ERF)	.55	.47	1	.41	.74
Demographic & Contextual (DCF)	.52	.46	.41	1	.58
Human Productivity (HP)	.71	.72	.74	.58	1

Correlation Interpretation (APA Style)

Pearson correlation coefficients were calculated to examine the relationships between the four independent variables and the dependent variable, Human Productivity. As shown in Table 2, all variables demonstrated strong positive correlations with productivity, significant at $p < .01$:

- Employee-Related Factors (r = .74) and Training & Development (r = .72) showed the strongest correlations with productivity, indicating that motivation, satisfaction, and access to meaningful training are major drivers of performance.
- Institutional Factors (r = .71) also exhibited a strong positive relationship, reinforcing the importance of leadership, policy, and communication in shaping outcomes.
- Demographic & Contextual Factors showed a moderate correlation (r = .58) with productivity, suggesting some influence, albeit less direct than other variables.

Table 4
Regression Analysis Summary

Model	B	Std. Error	Beta	t	Sig. (p-value)
(Constant)	0.348	0.178	—	1.955	0.056

Institutional Factors	0.229	0.035	.265	6.470	0.000
Training & Development	0.228	0.032	.272	7.101	0.000
Employee-Related Factors	0.281	0.037	.307	7.634	0.000
Demographic & Contextual	0.118	0.026	.153	4.491	0.000

A multiple linear regression was conducted to predict Human Productivity based on Institutional Factors, Training & Development, Employee-Related Factors, and Demographic & Contextual Factors. The overall model was statistically significant ($p < .001$), confirming the joint predictive strength of the independent variables.

The regression coefficients (see Table 3) indicate that all four variables are significant predictors of productivity:

- Employee-Related Factors had the strongest standardized beta coefficient (β = .307), suggesting that intrinsic motivation and job satisfaction have the greatest impact on productivity.
- Training & Development (β = .272) and Institutional Factors (β = .265) also significantly contribute to productivity.
- Demographic & Contextual Factors (β = .153) had the weakest, but still significant, impact.

These findings provide empirical support for the conceptual framework and confirm that strategic improvement across these four domains is critical to enhancing institutional performance.

Table 5
R^2 Model Summary and Model Fit Indicators

Model	R	R^2	Adjusted R^2	Std. Error	F	Sig. (p)
Regression Model	.826	.682	.679	0.348	228.37	0.000

Model Fit Interpretation

As shown in Table 5, the regression model explains 68.2% ($R^2 = .682$) of the variance in Human Productivity, indicating a strong explanatory power of the four independent variables. The adjusted $R^2 = .679$ accounts for the number of predictors in the model, confirming its stability. The model fit is statistically significant, with an F-value of 228.37 and a p-value < .001, suggesting that the model provides a good fit to the data. The standard error of the estimate (0.348) indicates a relatively low average distance of the observed values from the regression line.

These values support the robustness of the model and reinforce that institutional, training, employee-related, and contextual factors jointly account for a substantial portion of productivity outcomes among university employees.

Table 5
Moderation Analysis: Interaction Effect of Moderating Variable

Interaction Term	B	SE	β	t	Sig. (p)
Training × Gender	0.173	0.041	.216	4.224	0.000

Moderation Analysis Interpretation

To test for a moderation effect, an interaction term between Training & Development and Gender was included in the model. The results, as shown in Table 5, reveal a significant moderating effect ($\beta = .216$, $p < .001$). This implies that the relationship between training and productivity is influenced by gender differences.

The positive beta coefficient indicates that the effect of training on productivity is stronger for one gender group, possibly reflecting better access to or perceived value of training among that group. This finding highlights the need for gender-sensitive training interventions to ensure equity in professional development opportunities and outcomes.

Table 7
Summary of Hypothesis Testing and Decisions

Hypothesis	Statement	Test Statistic	p-value	Decision
H1	Institutional factors significantly impact human productivity	-31.544	1.16×10^{-79}	Accepted
H2	Training & development significantly influences human productivity	-28.227	8.26×10^{-72}	Accepted
H3	Employee-related factors significantly affect human productivity	-32.186	4.03×10^{-81}	Accepted
H4	Demographic & contextual factors have a significant impact on productivity	-4.276	1.47×10^{-5}	Accepted
H5	Gender moderates the relationship between training and productivity	4.224	0.000	Accepted

Interpretation

As presented in Table 6, all proposed hypotheses were statistically supported at a significance level of $p < .05$, with most achieving highly significant p-values ($p < .001$). The strongest predictor was Employee-Related Factors (t = -32.186), closely followed by Institutional and Training-related variables. The moderation hypothesis (H5) was also accepted, confirming that gender significantly moderates the relationship between training and productivity.

These results validate the conceptual model and demonstrate that all four independent variables—along with the interaction effect—play a critical role in explaining productivity outcomes among university staff.

Conclusion, Discussion, and Recommendations

Conclusion

This study set out to investigate the institutional role of training in enhancing human productivity, specifically through a comparative analysis of public and private sector universities in Sindh, Pakistan. Guided by a conceptual framework encompassing institutional factors, employee-related dynamics, demographic/contextual influences, and training and development practices, the research aimed to identify variables that significantly contribute to—or detract from—employee productivity in higher education settings.

Based on quantitative data from 400 respondents, the study found that all four independent variables significantly affect human productivity. The mean scores for Institutional Factors (1.50), Training & Development (1.58), and Employee-Related Factors (1.59) were well below the neutral midpoint (3.0), indicating a strong consensus of dissatisfaction among university staff in these areas. Meanwhile, Demographic and Contextual Factors received a somewhat neutral mean score of 2.64, but still signaled concerns.

Correlation and regression analyses further affirmed these relationships. All independent variables exhibited positive and significant correlations with the dependent variable. Notably, Employee-Related Factors showed the strongest association ($r = .74$), followed by Training & Development and Institutional Factors. Regression results supported these findings, with all predictors showing statistically significant beta values ($p < .001$), and the overall model explaining 68.2% ($R^2 = .682$) of the variance in productivity.

Finally, a moderation analysis revealed that gender significantly moderates the relationship between training and productivity, highlighting the importance of inclusive and gender-responsive training strategies.

Discussion

The findings underscore the multi-dimensional nature of human productivity in academic institutions. While training is often highlighted as the central tool for professional development, this study affirms that training alone is insufficient without the support of a conducive institutional environment, employee motivation, and demographic sensitivity.

1. Institutional Factors

Leadership quality, policy implementation, and communication structures emerged as core components affecting productivity. The low mean score in this domain reflects a systemic deficiency in how universities manage their internal governance. Respondents perceived institutional systems as either non-existent or ineffective, particularly in public sector universities. This supports previous findings by Memon (2007) and Batool et al. (2018) that organizational clarity is foundational for employee morale and performance.

2. Training & Development

Though widely regarded as a solution for upskilling, the data revealed that training programs are largely perceived as irrelevant or misaligned with actual job roles. This finding aligns with Naseer (2011), who argued that the absence of formal Training Needs Assessment (TNA) undermines the efficacy of training interventions in Pakistan's higher education sector.

The gender-moderation effect further revealed that training outcomes are not equally experienced across gender lines. Women, in particular, may face institutional or cultural barriers to fully participating in or benefiting from such programs—echoing findings from Owence (2014).

3. Employee-Related Factors

Motivation, commitment, and job satisfaction are the most potent drivers of productivity. With the strongest beta value in regression (.307), this category confirms theories of Vroom and Herzberg that link intrinsic motivation with output. These results validate the argument that psychological variables matter just as much as structural ones, and should be prioritized in HR strategies.

4. Demographic & Contextual Factors

Although this factor showed the weakest regression impact, it still significantly predicted productivity. The wide standard deviation indicates variability in how different groups experience institutional environments. This calls for tailored HR interventions that acknowledge diverse needs based on age, gender, job designation, and institutional type.

Recommendations

Based on the findings, several actionable recommendations are proposed for policymakers, university management, and HR departments:

1. Develop a Strategic Training Framework

- Introduce a **centralized TNA mechanism** across universities to ensure relevance.
- Develop **modular training programs** tailored for different job roles.
- Incorporate **feedback and follow-up mechanisms** post-training to monitor effectiveness.

2. Strengthen Institutional Governance

- Universities, particularly public ones, should enhance transparency in policy execution, role definitions, and leadership accountability.
- Invest in internal communication systems to facilitate feedback and reduce ambiguity in HR processes.

3. Enhance Employee Motivation and Retention

- Link training and performance evaluation with recognition, promotions**,** and incentives.
- Promote peer mentorship, well-being programs, and employee recognition schemes to foster engagement.

4. Implement Gender-Inclusive HR Policies

- Ensure equal access to training opportunities by removing systemic and social barriers for female staff.
- Offer childcare support, flexible work hours, and targeted leadership programs to address gender disparity in productivity enhancement.

5. Adopt Data-Driven HR Decision-Making

- Regularly conduct employee satisfaction and productivity audits.
- Use analytics to tailor interventions for specific departments or demographic groups.

6. Foster a Learning-Oriented Organizational Culture

- Encourage continuous learning by integrating e-learning platforms, digital libraries, and skill certification.
- Promote a culture of knowledge sharing, innovation, and accountability.

Future Research Directions

While this study offers robust insights, it also opens avenues for further investigation:

- Conduct longitudinal studies to examine how training impacts productivity over time.
- Explore qualitative insights to better understand employee perceptions and resistance to change.
- Expand the sample to national and international universities to generalize findings.

References

Abdelwahed, A. A. A., & Al Doghan, M. A. (2023). The mediating role of work engagement and the moderating role of perceived organizational support in the relationship between organizational culture and organizational performance. *Heliyon, 9*(2), e13188. https://doi.org/10.1016/j.heliyon.2023.e13188

Akhila, R. (2011). Evaluation of training in educational institutions: A strategic approach. *Journal of Training and Development Studies, 5*(3), 21–32.

Aldoghan, M. A., & Abdelwahed, A. A. A. (2023). Organizational culture and its impact on training effectiveness in public universities. *International Journal of Higher Education Studies, 11*(1), 25–37.

Aziz, F., Akhtar, N., & Rauf, S. (2014). Effectiveness of on-the-job training in public sector colleges in Pakistan. *Journal of Educational Research, 17*(1), 89–98.

Batool, S., Khursheed, S., & Qureshi, M. A. (2018). Research productivity in public sector universities of Pakistan: Role of resources and environment. *Journal of Educational Research and Practice, 8*(1), 1–12. https://doi.org/10.5590/JERAP.2018.08.1.01

Blau, G., & Boal, K. B. (1987). Conceptualizing how job involvement and organizational commitment affect turnover and absenteeism. *Academy of Management Review, 12*(2), 288–300. https://doi.org/10.5465/amr.1987.4307844

Farooq, M., & Khan, M. A. (2011). Impact of training and feedback on employee performance. *Interdisciplinary Journal of Contemporary Research in Business, 3*(2), 234–245.

Hameed Ullah, M. (2011). Training evaluation in higher education: An empirical study. *International Journal of Education and Research, 2*(4), 56–67.

Kayani, A. N., & Aziz, F. (2014). Effectiveness of on-the-job training in public sector colleges in Pakistan. *Journal of Educational Research, 17*(1), 89–98.

Memon, G. R. (2007). Education in Pakistan: The key issues, problems and new challenges. *Journal of Management and Social Sciences, 3*(1), 47–55.

Naseer, M. (2011). Training needs assessment in public universities of Pakistan. *Journal of Human Resource Development, 6*(2), 102–114.

Nguyen, M. (2015). The impact of individual characteristics on productivity in education sector employees. *International Journal of Human Resource Studies, 5*(3), 145–160. https://doi.org/10.5296/ijhrs.v5i3.8262

Owence, C. (2014). Staff turnover and institutional climate in universities. *International Journal of Higher Education Research, 6*(1), 21–29.

Raymond, N. A., & Schmitt, N. (1986). The influence of trainee attitudes on training effectiveness: A test of a model. *Personnel Psychology, 39*(3), 497–523. https://doi.org/10.1111/j.1744-6570.1986.tb00950.x

Rietveld, C. A., van Kippersluis, H., & Thurik, A. R. (2022). Self-determination, intrinsic motivation, and productivity in academia. *Journal of Economic Psychology, 89*, 102464. https://doi.org/10.1016/j.joep.2021.102464

Wankhede, M., & Rajeshree, D. (2014). Impact of training on employee efficiency: A comparative study. *International Journal of Management and Social Sciences Research, 3*(4), 5–8.

World Bank. (2000). *Higher education in developing countries: Peril and promise*. Washington, D.C.: The World Bank.