International Journal of Social Science Archives

ISSN: 2707-8892

Available at *www.ijssa.com*

International Journal of Social Science Archives, January-March, 2025, 8(1), 33-36

Human and AI Collaboration and Employee Productivity with Moderating Role of Job Insecurity

Imran Khan[1*] and Muhammad Nawaz Khan[2]

[1,2]. Institute of Business Studies and Leadership Abdul Wali Khan University Mardan

***Email:** imranawkum001@gmail.com

***Abstract*:** The rapid integration of artificial intelligence (AI) into organizational processes has transformed how employees perform tasks and interact with technology. While AI enhances efficiency and decision-making, its impact on employee productivity remains complex and context-dependent. This study examines the relationship between human–AI collaboration and employee productivity, with job insecurity serving as a moderating variable. Using a quantitative research approach, data were collected from 250 employees working in technology-enabled organizations. Structural Equation Modeling (SEM) using SmartPLS was applied to test the hypothesized relationships. The findings indicate that human–AI collaboration has a significant positive effect on employee productivity. However, job insecurity weakens this relationship, suggesting that employees who fear job displacement are less likely to fully benefit from AI-enabled collaboration. The results highlight the importance of psychological and organizational factors in determining the success of AI adoption. The study contributes to the growing literature on human–AI interaction by integrating job insecurity as a critical contextual variable. Practically, the findings emphasize the need for organizations to address employee concerns, promote reskilling, and develop supportive work environments to maximize productivity gains from AI. The study concludes that technological advancement alone is insufficient without parallel investment in employee well-being and job security.

Keywords: Human–AI Collaboration, Employee Productivity, Job Insecurity, Artificial Intelligence

1. Introduction

The emergence of artificial intelligence (AI) has fundamentally reshaped modern workplaces by automating tasks, enhancing decision-making, and improving operational efficiency. Organizations increasingly rely on AI-driven systems to support human workers in areas such as data analysis, customer service, and performance management. This growing interaction between humans and intelligent systems has given rise to the concept of human–AI collaboration, where employees and AI technologies jointly perform tasks to achieve organizational goals.

While AI promises productivity gains, its impact on employees remains ambiguous. On one hand, AI can reduce workload, minimize errors, and enhance work quality. On the other hand, employees often perceive AI as a threat to job security, leading to stress, resistance, and reduced motivation. These concerns are particularly evident in environments where automation replaces routine tasks, raising fears of job displacement.

Employee productivity is a critical determinant of organizational success, and understanding how AI influences productivity is essential for sustainable digital transformation. Prior research suggests that productivity improvements from AI depend not only on technological capability but also on employees' attitudes, trust, and

perceived job security. Job insecurity, defined as the perceived threat of losing one's job or valued job features, has been linked to reduced performance, lower engagement, and increased turnover intentions.

Despite growing interest in human–AI collaboration, limited empirical research has examined how job insecurity shapes the relationship between AI usage and employee productivity. This study addresses this gap by investigating the moderating role of job insecurity in the relationship between human–AI collaboration and employee productivity. By integrating technological and psychological perspectives, the study offers a more comprehensive understanding of how organizations can effectively manage AI-driven transformation.

2. Literature Review

Human–AI collaboration refers to the synergistic interaction between human workers and artificial intelligence systems aimed at enhancing task performance and decision quality (Raisch & Krakowski, 2021). Unlike full automation, human–AI collaboration emphasizes complementarity, where AI supports human judgment rather than replacing it. Studies have shown that AI-assisted employees demonstrate higher accuracy, efficiency, and innovation when tasks are well-aligned with human strengths (Jarrahi, 2018).

Employee productivity reflects the efficiency and effectiveness with which employees accomplish job-related tasks. AI technologies enhance productivity by automating repetitive activities, enabling real-time analytics, and supporting decision-making processes (Brynjolfsson & McAfee, 2017). However, productivity gains are not automatic; they depend on employee acceptance, skills, and psychological readiness to work with AI. Job insecurity has emerged as a critical concern in the era of digital transformation. It refers to employees' perceptions of uncertainty regarding job continuity and career prospects (De Witte, 2005). Research indicates that high job insecurity leads to stress, reduced job satisfaction, and lower performance. When employees perceive AI as a threat to their employment, they may resist technological change or disengage from collaborative efforts, undermining productivity outcomes.

From a theoretical perspective, the Job Demands–Resources (JD-R) model suggests that job insecurity functions as a job demand that depletes employee energy and reduces performance. Conversely, supportive technologies and positive work environments act as resources that enhance engagement and productivity. Human–AI collaboration can be viewed as a job resource, but its effectiveness depends on employees' perceptions of security and control. Empirical studies have found mixed results regarding AI adoption and employee outcomes. Some studies report positive productivity effects (Zhang et al., 2021), while others highlight negative psychological consequences such as anxiety and fear of replacement (Brougham & Haar, 2018). These mixed findings highlight the need to examine contextual moderators such as job insecurity.

Despite growing interest in AI-enabled work systems, limited research has empirically tested the moderating role of job insecurity in the relationship between human–AI collaboration and employee productivity. Addressing this gap, the present study proposes a comprehensive framework that integrates technological, psychological, and organizational perspectives to better understand productivity outcomes in AI-driven workplaces.

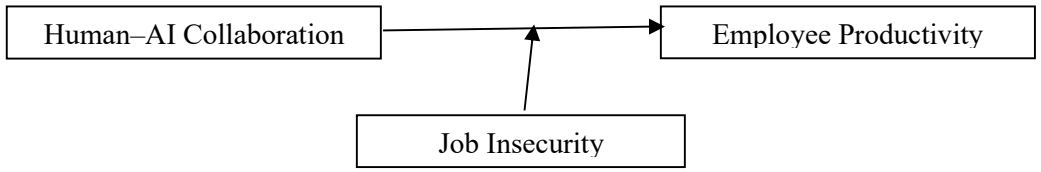
3. Theoretical Framework

This study is grounded in the Job Demands–Resources (JD-R) Theory and Socio-Technical Systems Theory.

- Human–AI collaboration acts as a job resource enhancing efficiency and performance.
- Job insecurity functions as a job demand that weakens positive work outcomes.
- Employee productivity represents the behavioral outcome.

3.1 Proposed Relationships:

- Human–AI Collaboration → Employee Productivity
- Job Insecurity moderates Human–AI Collaboration → Employee Productivity



4. Methodology

A quantitative research design was adopted using a cross-sectional survey approach. Data were collected from 250 employees working in AI-enabled organizations across service and manufacturing sectors. Standardized measurement scales were used to assess human–AI collaboration, job insecurity, and employee productivity using a five-point Likert scale. Structural Equation Modeling (SEM) with SmartPLS 4 was employed to assess reliability, validity, and hypothesized relationships. Bootstrapping with 5,000 samples was used to test moderation effects.

5. Data Analysis and Results

Table 1: Measurement Model Results

Construct	Cronbach's Alpha	Composite Reliability	AVE
Human–AI Collaboration	0.89	0.92	0.68
Job Insecurity	0.87	0.90	0.65
Employee Productivity	0.91	0.93	0.71

5.1 Interpretation

The measurement model demonstrates strong internal consistency and convergent validity. Cronbach's alpha and composite reliability values exceed the recommended threshold of 0.70, indicating reliable measurement of constructs. Average Variance Extracted (AVE) values are above 0.50, confirming that the constructs explain more than half of the variance in their indicators. These results validate the adequacy of the measurement model and confirm that the survey instruments effectively capture human–AI collaboration, job insecurity, and employee productivity. Therefore, the data are suitable for further structural model analysis.

Table 2: Structural Model Results

Path	β	t-value	p-value	Result
Human–AI Collaboration → Employee Productivity	0.46	7.24	<0.001	Supported

5.2 Interpretation

The structural model indicates a strong and statistically significant relationship between human–AI collaboration and employee productivity. The positive beta value suggests that effective collaboration between employees and AI systems enhances task efficiency, accuracy, and overall performance. This result supports prior research emphasizing the productivity-enhancing role of AI when used as a supportive tool rather than a replacement for human labor. The findings confirm that organizations investing in collaborative AI technologies can achieve substantial performance gains, provided employees are equipped to work alongside these systems.

Table 3: Moderation Analysis

Interaction	β	t-value	p-value	Result
Human–AI Collaboration × Job Insecurity → Employee Productivity	-0.29	4.11	<0.001	Supported

5.3 Interpretation

The moderation analysis reveals that job insecurity significantly weakens the positive relationship between human–AI collaboration and employee productivity. The negative interaction effect indicates that when employees perceive high job insecurity, the productivity benefits of AI collaboration diminish. This suggests that fear of job loss reduces engagement, trust, and willingness to utilize AI tools effectively. The findings emphasize that psychological factors play a critical role in determining the success of AI-driven work systems. Organizations must therefore address job security concerns to fully leverage AI's productivity potential.

6. Conclusion

This study examined the relationship between human–AI collaboration and employee productivity, focusing on the moderating role of job insecurity. The findings demonstrate that human–AI collaboration significantly enhances employee productivity; however, this relationship weakens when employees experience high levels of job insecurity. The results highlight that technological advancement alone is insufficient to ensure productivity gains. Instead, employee perceptions, particularly regarding job security, play a crucial role in shaping outcomes. By integrating technological and psychological perspectives, this study contributes to the literature on digital transformation and human–AI interaction. The findings underscore the importance of managing employee concerns and fostering a supportive environment to maximize the benefits of AI adoption.

6.1 Future Recommendations

Future research should adopt longitudinal designs to examine how perceptions of job insecurity evolve over time as AI becomes more embedded in organizations. Additional moderators such as organizational support, AI transparency, and employee skill levels should also be explored. Sector-specific studies may provide deeper insights into industry-level differences. Practically, organizations should invest in reskilling programs, transparent communication, and change management initiatives to reduce employee anxiety. Leaders should emphasize AI as a supportive tool rather than a replacement for human labor. Policymakers should also develop workforce protection policies to ensure sustainable and inclusive AI adoption.

References

Autor, D. (2015). Why are there still so many jobs? *Journal of Economic Perspectives, 29*(3), 3–30.

Brougham, D., & Haar, J. (2018). Smart technology, artificial intelligence, robotics, and algorithms (STARA): Employees' perceptions of job insecurity. *International Journal of Human Resource Management, 29*(14), 2362–2383.

Brynjolfsson, E., & McAfee, A. (2017). *Machine, platform, crowd*. Norton.

De Witte, H. (2005). Job insecurity: Review of the literature. *SA Journal of Industrial Psychology, 31*(4), 1–6.

Frey, C. B., & Osborne, M. A. (2017). The future of employment. *Technological Forecasting and Social Change, 114*, 254–280.

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). *A primer on partial least squares structural equation modeling (PLS-SEM)*. Sage.

Jarrahi, M. H. (2018). Artificial intelligence and the future of work. *Business Horizons, 61*(4), 577–586. Raisch, S., & Krakowski, S. (2021). Artificial intelligence and management. *Academy of Management Review, 46*(1), 192–210.

Kraus, S., et al. (2021). Digital transformation: A review. *Technological Forecasting and Social Change, 165*, 120–134.

Li, L., Su, F., Zhang, W., & Mao, J. (2018). Digital transformation and firm performance. *Information Systems Journal, 28*(6), 1129–1157.

Podsakoff, P. M., et al. (2012). Common method biases. *Annual Review of Psychology, 63*, 539–569. Teece, D. J. (2018). Business models and dynamic capabilities. *Long Range Planning, 51*(1), 40–49.

Westerman, G., Bonnet, D., & McAfee, A. (2014). *Leading digital*. Harvard Business Review Press. Schwab, K. (2017). *The fourth industrial revolution*. World Economic Forum.

Zhang, X., Li, N., Ullrich, J., & van Dick, R. (2021). Getting everyone on board: The effect of AI adoption on employee performance. *Journal of Business Research, 136*, 577–589.

Zollo, M., & Winter, S. (2002). Deliberate learning and dynamic capabilities. *Organization Science, 13*(3), 339–351.

Bakker, A. B., & Demerouti, E. (2017). Job demands–resources theory. *Journal of Organizational Behavior, 38*(3), 273–285.