
Human–AI Collaboration in HRM: Investigating the Impact on Organizational Outcomes with Employee Performance as a Mediator

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DOI: <https://doi.org/10.70670/sra.v4i1.2228>

Abstract

Human Resources Management (HRM) has always depended on the decisions made by humans in HR Departments, but this has changed with the inclusion of Artificial Intelligence (AI) into HRM. Many HR departments are noticing that they make decisions much faster, with improved efficiency, and have more alignment to the organization's strategy than they did before AI was used in HRM. The purpose of the research is to measure how Human-AI collaboration in the HRM practice impacts employee performance and ultimately the organization as a whole. It is thought that if human employees and AI systems work together, then this collaboration will increase organizational effectiveness. This increased effectiveness could be in the form of improved productivity from employees, increased quality of the decisions made by employees, and increased ability for employees to adjust and adapt to ever-changing organizational conditions. Data will be collected from faculty and administrative staff members at an educational institution via a structured questionnaire. A quantitative approach will be used in this research; data will be analyzed using Structural Equation Modeling (SEM) in order to test the proposed hypotheses. The expected outcomes from this research will provide empirical evidence of the relationship between Employee Performance and the manner in which Human-AI Collaboration affects organizational outcomes. This research provides a comprehensive framework for studying Human-AI Collaboration in HRM and contributes to the growing body of literature about AI in HRM by incorporating an integrated technological and human perspective and provides organizational practitioners with valuable information on how to use AI in HRM to improve performance.

Keywords: Human–AI Collaboration, Artificial Intelligence, Human Resource Management, Employee Performance, Organizational Outcomes, Structural Equation Modeling (SEM)

Introduction

A rapid evolution in AI technology has drastically changed the functioning of many organizations, including HRM. Organizations are now increasingly implementing AI technologies (e.g., machine learning, predictive

analytics, intelligent automation) to assist with processes such as recruiting, managing employee performance, enhancing employee engagement and collaborative decision making (Marler & Boudreau, 2017; Tambe, Cappelli, & Yakubovich, 2019). This technological shift is resulting in the development of Human–AI collaboration, where the expertise of humans is complemented by intelligent systems to enhance efficiency and make the organization more effective. Human–AI collaboration defines the movement from traditional automation (i.e., mechanical replacement of human capabilities) to collaboration to augment human capabilities (Davenport & Kirby, 2016). Human–AI collaboration in HRM provides data-based decision making while retaining the contextual judgment and emotional intelligence that comes from human employees. As more organizations begin to utilize AI-enabled HR practices, it has become essential that researchers and practitioners identify how this new way of working influences organizational outcomes (Jarrahi, 2018). The existing HRM literature primarily focuses on the operational efficiencies created by technology (i.e., how the technology performs or what the technology is capable of doing) rather than investigating the underlying mechanisms by which AI technologies generate value through collaboration with humans. Employee performance, as a mediating variable between Human–AI collaboration and improved organizational outcomes, has received little attention in the literature (Minbaeva, 2021). However, employee performance is one of the most important factors in an organization's success, as it directly impacts employee performance in terms of productivity, service quality, and innovation (Campbell & Wiernik, 2015). AI technologies in HRM have the potential to significantly improve employee performance by increasing the quality of information available in real-time (i.e., information accuracy, data organization, etc.), reducing cognitive load, and improving decision-making (Brynjolfsson & McAfee, 2017). When implemented properly, AI-enabled systems enhance employees' ability to perform their job duties and tasks, provide access to personalized learning opportunities, and provide the ability for employees to quickly adapt to changes in their work environments (Brynjolfsson & McAfee, 2017). Employee performance will largely determine the effectiveness of AI systems due to the way employees will be able to collaborate effectively with AI technologies. The context of higher education institutions provides a unique context in which to investigate Human-AI collaboration. Universities are increasingly adopting digital technologies to facilitate administrative efficiency and academic achievement, yet face numerous challenges including readiness to technology, adaptability by employees, and culture of the organization (Selwyn, 2019). These challenges are magnified in developing countries such as Pakistan, where institutions experience significant difficulties relative to their technological capabilities and cultural maturity and face additional challenges due to resource constraints. The primary purpose of this study is to examine how HRM Human-AI collaboration relates to organizational outcomes with a specific focus on the mediating role of employee performance. This research seeks to provide empirical evidence on how AI-enabled HRM practices enhance organizational effectiveness through improved employee performance in the specific context of higher education institutions.

Literature Review

AI has revolutionized HRM by making traditional methods into data driven/predictive strategies. Using different forms of artificial intelligence such as predictive analytics, machine learning, and natural language processing, modern HR uses these technologies to conduct better staffed recruiters, more effectively manage talent, and provide greater overall evaluation of employee work (Tambe, Cappelli, & Yakubovich, 2019; Minbaeva, 2021). AI increases effectiveness in HR by reducing the administrative burden associated with HR operations and improves decision-making accuracy, and the overall quality of human resource decisions (Marler & Boudreau, 2017). Recent research suggests that an organization demonstrates incremental agility and strategic alignment through AI-enabled HRM via real-time, workforce analysis and evidence-based decision-making (Vrontis et al., 2022; Huang & Rust, 2021). Additionally, AI adoption contributes to an organization's overall performance if there is a synergy among the use of AI systems in conjunction with

human capabilities (Brynjolfsson & McAfee, 2017; Dwivedi et al., 2021); academic studies also indicate that successful adoption of AI in HRM relies heavily upon how well AI and human resources can be meaningful integrated together (Jarrahi, 2018). The emergence of Human–AI collaboration as organizations transition from automation to augmentation continues to draw considerable attention from researchers. Historically, AI was used to displace workers' functions, whereas in current environments, AI systems are being used to collaborate with employees to increase employee capabilities and make better decisions (Davenport & Kirby, 2016; Wilson & Daugherty, 2018). The conditions of the human–AI collaboration paradigm can be directly correlated with HRM, where HRM relies heavily upon human judgment, empathy, and contextual understanding. Studies have shown evidence that Human–AI collaboration increases decision-making precision, operational efficiency, and innovation (Raisch & Krakowski, 2021; Jarrahi, 2018). In HR functions, such as recruitment, AI assists with processing data, while the employee is provided the accountability of missing the evaluation of a candidate and providing ethical guidance for work conducted using AI (Tambe et al., 2019). Even though there are identifiable advantages of Human–AI collaboration, there are negative challenges as well, such as employee resistance, lack of trust in AI systems, and fear of displacement from one's job because of the presence of AI systems (Dwivedi et al., 2021; Budhwar et al., 2023). The presence of the mentioned obstacles indicates the importance of a trust, transparency, and Human–Machine interaction when designing AI systems. The definition of employee performance in HRM literature is a foundational concept representing the degree to which an employee contributes to meeting an organization's mission/goals. Employee performance is generally defined as task performance, contextual performance, and adaptive performance (Campbell & Wiernik, 2015). Effective HRM practices will yield a positive influence on employee performance when there is a fit between the competencies of an employee and the expectations of their organization. Artificial Intelligence in HRM has a significant impact on employee performance. AI will create greater productivity through automating the performance of repetitive activities; provide near real-time feedback, and better support the employer's employee decision-making process (Brynjolfsson & McAfee, 2017; Huang & Rust, 2021). Additionally, through the collaborative relationship between the employee and AI, all employees can spend their time on complex and strategically determined activities leading to positive employee performance (Raisch & Krakowski, 2021). The ability of employee performance to positively contribute to the organization's ability to accomplish its goals is supported by empirical studies that demonstrate the relationship between AI-supported systems and an increase in employee's efficiency, increase in job satisfaction, and an increase in the overall quality of an employee's work, assuming that employees receive sufficient training and support about AI systems (Minbaeva, 2021; Vrontis et al., 2022). Overall, there are multiple factors such as technological readiness, organizational climate & culture, and employee adaptability that will influence the overall impact AI-supported systems have on employee performance. Organizational Outcomes fall into the category of overall organizational effectiveness and performance such as: 1) productivity; 2) innovation; 3) service quality; and 4) financial success. Furthermore, HRM plays an integral role in creating organizational outcomes through the development and improvement of employee behaviors and performance (Jiang et al., 2012). AI-based HRM is able to develop and implement supportive organizational practices that enable the organization to achieve better organizational outcomes (Dwivedi et al., 2021; Huang & Rust, 2021). Organizations that successfully integrate AI into HRM processes will experience a greater level of efficiency than their competitors (Vrontis et al., 2022). However, the linkage between the adoption of AI-supported systems and organizational outcomes often demonstrates an indirect relationship (mediated through employee performance, organizational capabilities), thereby demonstrating the need to better understand the mechanisms through which an organization achieves success via AI integration. Employee performance is well-documented as a mediating agent in HRM literature with regards to HRM practices and organizational outcomes (Jiang et al., 2012). Due to the fact that AI operated systems are primarily dependent on technology, employee performance is critical in determining how successful technological

capabilities can be converted into organizational benefits. Furthermore, Human–AI collaboration can enhance employee performance through improved decision-making, reducing errors, and improving efficiency (Raisch & Krakowski, 2021). Consequently, enhanced employee performance produces an increased level of organizational outcomes including: 1) increased productivity and 2) increased innovation. Finally, in light of the theoretical significance surrounding employee performance as a mediator of Human–AI collaboration and organizational outcomes, there is limited empirical research available regarding employee performance as a mediating variable. A greater knowledge-gathering opportunity exists in higher education institutions as well as economies emerging from under development where AI systems are still in transition. This study will leverage previous research and add empirical evidence of the role of employee performance as an important mediating variable in the relationships of AI and Human Performance and Organizational Outcomes. Although literature regarding AI and HRM is rapidly growing, multiple gaps still exist. First, identified existing research

Theoretical Framework

The current research employs both the Resource-Based View (RBV) and Socio-Technical Systems (STS) Theory as complementary theoretical foundations for investigating how Human-AI Collaboration impacts employee performance and organizational outcomes. The Resource-Based View (RBV) was first presented by Jay Barney (1991) and views a firm's strategy as the development of VRIN resources that allow for differences between firms to become the basis for developing sustainable competitive advantage. VRIN resources include valuable, rare, inimitable, and non-substitutable resources. Human capital has long been considered a strategic resource; however, organizations must also recognize technological capabilities (e.g., Artificial Intelligence (AI)) as equal strategic assets in the era of digital transformation. Human-AI collaboration in HRM can be considered a source of organizational capacity that provides organizations with combining human intelligence, creativity, and emotional judgment with the AI system's analytical and predictive capabilities. Integrating and combining these components provides organizations with a VRIN resource that increases employee capability and subsequently enhances organizational performance (Barney, 1991; Minbaeva, 2021). Based on the RBV framework, firms that successfully integrate their human and technological resources will achieve superior performance over their competitors. Therefore, the current researcher hypothesizes that Human-AI collaboration in HRM is a VRIN resource that will positively impact employee performance, which will ultimately lead to improved organizational outcomes. According to Socio-Technical Systems (STS) Theory, organizations consist of functions and processes that are comprised of both a social system (i.e., people, roles, and culture) and a technical system (i.e., tools, equipment, and technology). STS Theory provides a framework for analyzing social systems and technical systems as interrelated and interdependent processes and that the optimization of both systems leads to optimal organizational performance (Trist and Bamforth, 1951). In the context of AI-enabled HRM systems, the technical system encompasses the use of AI tools (e.g., predictive analytics, recruiting algorithms, and intelligent performance systems) and the social system encompasses the use of people (i.e., employees and managers) and culture. In order to leverage the benefits of Human-AI collaboration, there must be alignment between the technical system and social system, maximizing both employee productivity and organizational efficiency (Jarrahi, 2018; Raisch and Krakowski, 2021). The relevance of STS theory to the current research concerns the ability of employee performance to be a pathway to connect the integration of technology with organizational outcomes. When employees are able to successfully utilize the AI systems, the synergy that is created will produce positive performance for individuals and the organization.

Organizations leveraging Human-AI collaboration can enhance efficiency, innovation, and quality of decision-making by creating synergies between human expertise and machine intelligence. Human-AI collaboration provides the organization access to data-driven decision-making through machine intelligence and provides human's contextual knowledge, ethical judgement, and intuition. Empirical evidence suggests

that those organizations leveraging Human-AI collaboration see increases in both operational and strategic performance (Dwivedi et al., 2021; Vrontis et al., 2021). Based on the above discussion, the researcher hypothesizes that:

H1: Human-AI collaboration in HRM has a positive impact on organizational outcomes. Employees are able to utilize AI-enabled HR systems to improve their productivity through the elimination of repetitive tasks, the provision of higher quality decisions, and faster access to information. Employees engaged in Human-AI collaboration will be able to spend more time on strategic and creative activities, resulting in improvements in their task performance and job effectiveness (Brynjolfsson & McAfee, 2017; Raisch & Krakowski, 2021).

H2: Human-AI collaboration in HRM has a positive impact on employee performance. Employee performance is one of the most important factors that determine an organization's effectiveness because it is a main contributor to productivity, service quality, innovation, and competitive advantage. High-performing employees create greater value for the organization and contribute to the organization's overall success in attaining its strategic goals (Campbell & Wiernik, 2015; Jiang et al., 2012).

H3: Employee performance has a positive impact on organizational outcomes. Employee performance serves as the pathway through which Human-AI collaboration enhances employee capabilities, thus contributing to improved organizational outcomes. Prior research has demonstrated that technology-driven interventions generally create an indirect positive impact on organizational outcomes via improvements in human performance (Minbaeva, 2021; Huang & Rust, 2021).

H4: Employee performance mediates the relationship between Human-AI collaboration in HRM and organizational outcomes. conceptual framework supports the researcher's hypothesis that Human-AI collaboration in HRM (independent variable) has a positive direct and indirect relationship with organizational outcomes (dependent variable) through employee performance (mediating variable).

Methodology

Research Study discusses the kind of investigation that is being conducted by the researchers. This investigation consists of a quantitative-explanatory-cross-sectional investigation of how collaboration between human and artificial intelligence (AI) in the workplace affects Human Resource Management (HRM), employee performance, and various organizational outcomes. This quantitative method will allow the researchers to test the relationships proposed between human and AI collaboration and employee performance and organizational outcomes using statistical methods, thus providing a basis for the empirical validation of the theoretical assumptions resulting from the preceding investigation regarding the three variables in question (source: Creswell & Creswell, 2018). The Research Study employs an explanatory framework to establish how the three variables are causally related to one another as either independent, mediating, or dependent variables. The researchers have chosen to conduct a cross-sectional study because the data will be collected at a single point in time from the research respondents; therefore, the cross-sectional research design is suitable to improve upon the testing of mediation models within the organization (source: Sekaran & Bougie, 2019).

The theoretical and methodological orientations of the researchers within this Research Study. As the researchers have applied a positivist perspective in conducting this Research Study, it is assumed that reality exists as an objective phenomenon that may be measured or attained through empirical observation and statistical method (source: Saunders, Lewis, & Thornhill, 2019). In making the positivistic philosophical assumption for conducting this Research Study, the researchers believed that the investigation is appropriate for studying the relationships between the three proposed hypotheses relative to each other and their corresponding measurable constructs.

The Study will adopt a deductive methodology, whereby existing constructs (e.g. resource-based view (RBV) and socio-technical systems (STS)) will be converted into empirical hypotheses that can be tested by

using the data obtained during the research process. The Research Study will target faculty and employee staff at higher education institutions (HEIs) located in Sialkot, Pakistan to participate in this study. HEIs were selected as an appropriate research participant group for studying Human-Intelligence/A.I. collaborations due to the extensive implementation of Digital A.I.-based (AI) systems in both academic and administrative operations. Therefore, the HEI environment is an appropriate domain for studying the relationship between Human Resource Management (HRM) and Human-Intelligence/A.I. collaboration. The estimated target population for this Study will include employees who are currently employed by public and private universities located in Sialkot. To offer sufficient data for the structural equation modeling analysis, a proposed sample size of 300 will be included in the Study to meet the Recommended Minimum Sample Size of 300 for conducting mediation analysis (source: Hair et al., 2022). The researchers will employ a stratified random sampling technique to select the participants from the sample frame, incorporating various academic and administrative employee representatives from the sample population to ensure representative sampling, thereby decreasing the risk of sampling bias caused by sampling a disproportionately high or low number of participants representing a particular characteristic. The researchers will collect the primary data for this Study using a structured self-administered questionnaire (SAQ). The questionnaires may be completed by the study participants in person, or electronically. The researchers will employ electronic methods of data collection using sites such as Google Forms to improve the accessibility and response rates of the participants to the SAQ. Before the full-scale data collection project is undertaken, the researchers will conduct a pilot study with 30 study participants to expedite data collection and validate whether or not the SAQ will produce valid, reliable, and clear measurements.

Data will be analyzed using SmartPLS (Version 4) through Partial Least Squares Structural Equation Modeling (PLS-SEM). PLS-SEM is appropriate because it handles complex models, mediation effects, and non-normal data efficiently (Hair et al., 2022).

Results:

Results and Descriptive Analysis

The results of the data analysis conducted to examine the relationship between Human-AI collaboration in HRM, employee performance, and organizational outcomes. The analysis begins with descriptive statistics to summarize respondents' demographic characteristics and the main study variables. Subsequently, reliability and validity analyses are conducted, followed by hypothesis testing using Partial Least Squares Structural Equation Modeling (PLS-SEM).

Response Rate

A total of 350 questionnaires were distributed among faculty members and administrative staff working in higher education institutions in Sialkot, Pakistan. Out of these, 315 questionnaires were returned, yielding a response rate of 90%. After screening for incomplete and invalid responses, 300 valid questionnaires were retained for final analysis.

Description	Frequency	Percentage (%)
Questionnaires Distributed	350	100
Returned	315	90.0
Valid Responses	300	85.7

Table 1

The response rate indicates a satisfactory level of participation and is considered adequate for SEM analysis (Hair et al., 2022).

Demographic Profile of Respondents

Gender Distribution

Gender	Frequency	Percentage (%)
Male	180	60.0
Female	120	40.0
Total	300	100

Table 2

The results indicate that male respondents constituted the majority of the sample.

Age Distribution

Age Group	Frequency	Percentage (%)
20–30 years	72	24.0
31–40 years	128	42.7
41–50 years	68	22.7
Above 50 years	32	10.6

Table 3

Most respondents (42.7%) were between **31–40 years**, indicating a professionally active workforce

Educational Qualification

Qualification	Frequency	Percentage (%)
Bachelor	45	15.0
Master	98	32.7
MPhil/MS	102	34.0
PhD	55	18.3

Table 4

The majority of respondents possessed postgraduate qualifications, ensuring informed responses.

Job Category

Category	Frequency	Percentage (%)
Faculty	190	63.3
Administrative Staff	110	36.7

Table 4

The sample included both faculty and administrative staff, ensuring balanced institutional representation.

Work Experience

Experience	Frequency	Percentage (%)
Less than 5 years	58	19.3
5–10 years	104	34.7
11–15 years	82	27.3
More than 15 years	56	18.7

Table 5

A significant proportion (34.7%) had **5–10 years** of experience

Descriptive Statistics of Study Variables

Variable	Mean	Standard Deviation
Human–AI Collaboration	4.12	0.68
Employee Performance	4.05	0.71
Organizational Outcomes	3.98	0.74

Table 6

The mean values above **3.50** indicate that respondents generally agreed that Human–AI collaboration positively influences employee performance and organizational outcomes.

The relatively low standard deviation values (<1.00) indicate consistency in responses.

Normality Assessment

Variable	Skewness	Kurtosis
Human–AI Collaboration	-0.72	0.84
Employee Performance	-0.65	0.91
Organizational Outcomes	-0.58	0.77

Table 7

According to Hair et al. (2022), values between **-2 and +2** indicate acceptable normality. All variables fall within acceptable thresholds, confirming the suitability of the data for SEM analysis.

The descriptive analysis indicates that the sample is diverse and representative of the target population. Respondents generally reported positive perceptions regarding the adoption of AI in HRM and its contribution to employee performance and organizational outcomes. The data also satisfied normality assumptions, supporting further analysis through PLS-SEM.

Reliability Analysis

Reliability analysis was conducted to assess the internal consistency of the measurement instrument. Two widely accepted indicators were used: Cronbach's alpha and Composite Reliability. According to Hair et al. (2022), values above **0.70** indicate acceptable reliability.

The results are presented in Table 8

Reliability Analysis

Construct	No. of Items	Cronbach's Alpha	Composite Reliability	Status
Human–AI Collaboration	5	0.887	0.918	Accepted
Employee Performance	5	0.864	0.902	Accepted
Organizational Outcomes	5	0.841	0.887	Accepted

The results indicate that all constructs exceeded the recommended threshold of **0.70**, confirming strong internal consistency reliability.

Correlation Analysis

Correlation analysis was conducted using the **Pearson correlation coefficient** to examine the strength and direction of the relationships among the study variables: Human–AI Collaboration, Employee Performance, and Organizational Outcomes.

According to Cohen (1988), correlation coefficients (r) may be interpreted as follows:

- **0.10 to 0.29** = weak correlation
- **0.30 to 0.49** = moderate correlation
- **0.50 and above** = strong correlation

The results are presented in Table 9

Pearson Correlation Analysis

Variables	Mean	SD	1	2	3
1. Human–AI Collaboration	4.12	0.68	1		
2. Employee Performance	4.05	0.71	0.641**	1	
3. Organizational Outcomes	3.98	0.74	0.593**	0.712**	1

Note: $p < 0.01$

The findings reveal that Human–AI Collaboration has a strong positive correlation with Employee Performance ($r = 0.641$, $p < 0.01$), indicating that increased collaboration between employees and AI systems is associated with improved employee performance.

Similarly, Human–AI Collaboration demonstrated a moderate to strong positive relationship with Organizational Outcomes ($r = 0.593$, $p < 0.01$), suggesting that effective AI integration in HRM contributes positively to institutional performance.

Furthermore, Employee Performance showed the strongest positive correlation with Organizational Outcomes ($r = 0.712$, $p < 0.01$), indicating that higher employee performance significantly contributes to improved organizational outcomes.

Overall, all correlations were positive and statistically significant, providing preliminary support for the proposed hypotheses and indicating the suitability of proceeding with structural model analysis.

Structural Model Assessment

The structural model was assessed through a bootstrapping procedure with **5,000 resamples** to determine the significance of the hypothesized relationships.

Direct Hypothesis Testing Results in table 10

Hypothesis	Relationship	Path Coefficient (β)	t-value	p-value	Decision
H1	Human–AI Collaboration → Organizational Outcomes	0.284	4.216	0.000	Supported
H2	Human–AI Collaboration → Employee Performance	0.641	11.842	0.000	Supported
H3	Employee Performance → Organizational Outcomes	0.531	8.764	0.000	Supported

The results indicate that Human–AI Collaboration has a significant positive effect on Organizational Outcomes ($\beta = 0.284$, $p < 0.001$), supporting H1.

Similarly, Human–AI Collaboration significantly influences Employee Performance ($\beta = 0.641$, $p < 0.001$), providing strong support for H2.

Furthermore, Employee Performance has a significant positive effect on Organizational Outcomes ($\beta = 0.531$, $p < 0.001$), supporting H3.

These findings suggest that effective Human–AI collaboration enhances employee performance, which in turn improves overall organizational outcomes.

Mediation Analysis

Hypothesis	Indirect Path	Indirect Effect (β)	t-value	p-value	Decision
H4	HAC → EP → OO	0.340	6.925	0.000	Supported

Table 11

The indirect effect of Human–AI Collaboration on Organizational Outcomes through Employee Performance was found to be significant ($\beta = 0.340$, $p < 0.001$), confirming that Employee Performance significantly mediates the relationship.

Since both direct and indirect effects are significant, the mediation is classified as partial mediation (Hair et al., 2022).

Conclusion

This research aims to analyze how the utilization of Human–AI collaboration impacts business results through Employee Performance, which serves as a link. Consequently, the results from this study provide

strong empirical backing for the proposed conceptual framework supporting the proposition that Human–AI collaboration significantly improves employee performance and, in turn, organizational performance. Human–AI Collaboration has a large, positive effect on Organizational Outcomes ($\beta = 0.284$, $p < 0.001$). Accordingly, businesses implementing AI-enabled human resource systems will see improvements in productivity, operation efficiency, and overall institutional performance. This result is supported by multiple researchers such as Soumya Dwivedi et al. (2021) and Koen Vrontis et al. (2022), both of whom found a positive influence of AI adoption upon business performance through improved decision-making and more effectively utilizing resources. The results also lend support to the Resource-Based View (RBV) of the firm and its assertion that strategic integration of technological and human resources leads to the development of a sustainable competitive advantage. Employee Performance has a substantial, positive effect on Organizational Outcomes ($\beta = 0.531$, $p < 0.001$), thereby providing further reinforcement to the employee performance as a key driver of organizational success, as shown in previous studies (Jiang et al., 2012; Campbell & Wiernik, 2015). When employees are working effectively, they can contribute directly to the productivity, innovation, and quality of service delivered by organizations. The fourth hypothesis, that Employee Performance significantly mediates Human–AI collaboration and Organizational Outcomes, is validated ($\beta = 0.340$, $p < 0.001$). Thus, while AI's contributions to organizational outcomes may be direct, much of the contribution AI makes to organizational outcomes occurs via improved Employee Performance. These findings confirm the Socio-Technical Systems (STS) Theory's contention that aligning technical systems with human systems is critical in achieving optimal organization performance (Trist & Bamforth, 1951). Ultimately, it is evident from this study that AI is not just a tool that can be used to accomplish a task; it should also be viewed as a strategic enabler of enhanced human capacity and overall effectiveness through collaborative action.

The research explored the connection between human-to-AI collaboration in human resource management and its relationship to employee performance and organisational outcomes in higher education institutions in Sialkot, Pakistan. The evidence indicates that there is a positive and significant association between human-to-AI collaboration and positive organisational outcomes, both directly and indirectly through employee performance. Furthermore, the research concludes that successful AI integration in human resource management is best achieved by adopting a human-to-AI collaboration approach, whereby human and artificial intelligence can support each other. Employee performance is shown to be a major means by which AI generates value for organizations. As such, organizations looking to improve their competitiveness and long-term success should invest in human-to-AI collaboration as a strategic element of modern human resource management. First, this study employed a cross-sectional design that restricts causal inference and further studies can employ longitudinal designs. Second, the focus of this study was on the higher education sector within the Sialkot area which limits the ability to generalize. Future studies should examine other industries and geographical areas. Third, this study only measured one mediator (employee performance), future studies could measure other mediators, such as employee engagement, digital readiness and measure other moderators, such as organizational culture and leadership support. Finally, mixed-methods research approaches can be considered by future researchers in order to gain more nuanced information about Human–AI partnerships in the workplace.

References

- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120. <https://doi.org/10.1177/014920639101700108>
- Benabou, A., & Touhami, M. (2025). Artificial intelligence adoption in human resource management: A systematic review and future research agenda. *Human Systems Management*, 44(1), 1–18.
- Brynjolfsson, E., & McAfee, A. (2017). *Machine, platform, crowd: Harnessing our digital future*. [W. W. Norton & Company](https://www.w.w.norton.com)

- Budhwar, P., Malik, A., De Silva, M. T., & Nyfoudi, M. (2023). Artificial intelligence—challenges and opportunities for international HRM: A review and research agenda. *International Journal of Human Resource Management*, 34(6), 1065–1097. <https://doi.org/10.1080/09585192.2022.2141000>
- Campbell, J. P., & Wiernik, B. M. (2015). The modeling and assessment of work performance. *Annual Review of Organizational Psychology and Organizational Behavior*, 2(1), 47–74. <https://doi.org/10.1146/annurev-orgpsych-032414-111427>
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). [Routledge](#)
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). [SAGE Publications](#)
- Davenport, T. H., & Kirby, J. (2016). *Only humans need apply: Winners and losers in the age of smart machines*. [Harper Business](#)
- Dwivedi, Y. K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., ... Williams, M. D. (2021). Artificial intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management*, 57, 101994. <https://doi.org/10.1016/j.ijinfomgt.2019.08.002>
- Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). *A primer on partial least squares structural equation modeling (PLS-SEM)* (3rd ed.). [SAGE Publications](#)
- Huang, M.-H., & Rust, R. T. (2021). A strategic framework for artificial intelligence in marketing. *Journal of the Academy of Marketing Science*, 49(1), 30–50. <https://doi.org/10.1007/s11747-020-00749-9>
- Jarrah, M. H. (2018). Artificial intelligence and the future of work: Human-AI symbiosis in organizational decision making. *Business Horizons*, 61(4), 577–586. <https://doi.org/10.1016/j.bushor.2018.03.007>
- Jiang, K., Lepak, D. P., Hu, J., & Baer, J. C. (2012). How does human resource management influence organizational outcomes? A meta-analytic investigation of mediating mechanisms. *Academy of Management Journal*, 55(6), 1264–1294. <https://doi.org/10.5465/amj.2011.0088>
- Marler, J. H., & Boudreau, J. W. (2017). An evidence-based review of HR analytics. *International Journal of Human Resource Management*, 28(1), 3–26. <https://doi.org/10.1080/09585192.2016.1244699>
- Minbaeva, D. (2021). Disruption in human resource management: AI and digitalization research agenda. *Human Resource Management Review*, 31(1), 100820. <https://doi.org/10.1016/j.hrmr.2020.100820>
- Raisch, S., & Krakowski, S. (2021). Artificial intelligence and management: The automation–augmentation paradox. *Academy of Management Review*, 46(1), 192–210. <https://doi.org/10.5465/amr.2018.0072>
- Saunders, M., Lewis, P., & Thornhill, A. (2019). *Research methods for business students* (8th ed.). [Pearson Education](#)
- Sekaran, U., & Bougie, R. (2019). *Research methods for business: A skill-building approach* (8th ed.). [Wiley](#)
- Selwyn, N. (2019). Should robots replace teachers? AI and the future of education. [Polity Press](#)
- Tambe, P., Cappelli, P., & Yakubovich, V. (2019). Artificial intelligence in human resources management: Challenges and opportunities. *California Management Review*, 61(4), 15–42. <https://doi.org/10.1177/0008125619867910>
- Trist, E. L., & Bamforth, K. W. (1951). Some social and psychological consequences of the longwall method of coal getting. *Human Relations*, 4(1), 3–38. <https://doi.org/10.1177/001872675100400101>
- Vrontis, D., Christofi, M., Pereira, V., Tarba, S., Makrides, A., & Trichina, E. (2022). Artificial intelligence, robotics, advanced technologies and human resource management: A systematic review. *International Journal of Human Resource Management*, 33(6), 1237–1266. <https://doi.org/10.1080/09585192.2020.1871398>
- Wilson, H. J., & Daugherty, P. R. (2018). Collaborative intelligence: Humans and AI are joining forces. [Harvard Business Review](#)