Weathering the Storm: The Impact of Artificial Intelligence in the IT Industry Post-COVID-19 Epidemic and the Role that Employee Learning and Development Plays in Enhancing Employee Performance - A Mediation Approach

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Abstract. The COVID-19 pandemic has greatly accelerated the integration of artificial intelligence into the IT industry. This study examines the multifaceted implications of AI adoption in the post-pandemic IT landscape, with a particular focus on the role of employee learning and development as a strategy to improve employee performance. Explore the impact of AI on the structure, operations and overall performance of the IT industry in the wake of the COVID-19 pandemic. We assess how well staff can adapt to technological breakthroughs driven by artificial intelligence and address changing skills needs. Assess the effectiveness of mediation strategies to bridge the gap between AI integration and employee learning, resulting in better overall organizational performance. The study used qualitative techniques and data collected through a structured questionnaire was provided by IT staff of reputed Indian IT companies. A total of 388 valid responses were collected from 492 employees of the target group who received the questionnaire. The researcher used partial least squares structural equation modeling. Research shows the potential that AI-led learning and development can improve employee performance in the AI-driven IT sector. Companies can expect improved employee performance, including improved productivity and quality of work, when they invest in AI-based learning and development for their IT staff. AI can be used to change the difficulty level of learning materials based on the employee's performance. Not only are they neither above nor below the challenges, this ensures that the employee is always learning at an appropriate pace.

Keywords: Artificial Intelligence, Learning and Development, Employee Performance, Mediation Approach.

1   INTRODUCTION

Artificial intelligence (AI) is rapidly transforming the IT industry. AI-powered solutions are being used to automate tasks, improve efficiency, and gain insights that were not possible before [22]. The COVID-19 pandemic has accelerated the adoption of AI in the IT industry, as organizations have sought to streamline operations and improve resilience. The adoption of AI is having a significant impact on the work of IT employees. AI-powered tools and technologies are automating tasks, freeing up IT staff to focus on more strategic initiatives [6]. However, to take advantage of these opportunities, IT employees need to develop the skills and knowledge to use AI technologies effectively. Employee learning and development facilitate the skills and knowledge of IT employees to compete in the era of AI adoption [2]. L&D programs can help employees to: Understand the basics of AI, learn how to use AI tools and technologies, Develop AI-related skills, Develop soft skills such as adaptability, collaboration, and communication. In the contemporary landscape of the IT industry, the integration of AI has become a critical determinant of competitive advantage and organizational success. However, the successful adoption and utilization of AI technology are contingent upon the knowledge and skills possessed by the workforce. Recognizing the importance of employee learning and development in the context of AI integration is essential for organizations aiming to navigate the complexities of this evolving technological landscape. Research may not thoroughly investigate the effectiveness of mediation strategies, such as mentorship programs or peer-to-peer learning, in the context of AI-supported employee learning and development. Understanding how these strategies interact with AI-driven learning tools and platforms could be an area that requires further exploration. The role of mediation strategies in facilitating smooth organizational change during the implementation of AI technologies might be an aspect that requires deeper examination. Understanding how mediation can support employees during periods of technological transition and organizational change management could be an essential research gap. By focusing on these research gaps, scholars and practitioners can contribute to a more comprehensive understanding of the role of mediation strategies in the context of AI integration and employee learning and development, ultimately fostering a more effective and holistic approach to implementing AI-driven initiatives within organizations.

2   RESEARCH BACKGROUND

 AI in the IT industry post-COVID- An overview of artificial intelligence history AI in the IT sector following COVID-19 is characterized by a sharp increase in the use and integration of AI-driven solutions [1] . The global health crisis acted as a trigger

for the broad use of AI solutions, resulting in notable breakthroughs and developments in the IT industry [9]. This study adopts Victor Vroom's Expectancy Theory, a motivation theory that describes the mental processes underlying people's decisions to select one course of action over another. The theory predicts and explains motivation and behavior in the workplace by concentrating on the ideas of valence, instrumentality, and expectation. The research focus on determining the factors form artificial intelligence in the IT industry post-COVID-19 epidemic and the role that employee learning and development play in enhancing employee performance. The secondary objectives were to identify the specific ways in which AI is being used in the IT industry post-COVID-19 epidemic. To assess the impact of AI adoption on employee performance in the IT industry. To investigate the role of L&D in mediating the relationship between AI adoption and employee performance in the IT industry. To develop recommendations for how organisations in the IT industry can design and deliver L&D programmes in the crucial adoption of AI.

3   LITERATURE REVIEW

3.1   Artificial intelligence (AI) in IT industry

Automation: In the IT sector, artificial intelligence is being utilized to automate a variety of operations, including network administration and software testing [10]. IT personnel will now have more time to devote to strategic and innovative work. AI is being utilized to help in the IT industry's decision-making process by assisting in the identification of patterns and trends that would be difficult or impossible for humans to notice. Better risk management, more efficient use of resources, and more successful marketing efforts are the results of this. AI is being utilized in the IT sector to produce innovative goods and services [11]. These are a few specific scenarios of how AI is being applied in various IT industry sectors: Software development: Code review, unit testing, and bug fixes are among the processes that AI is being utilized to automate. This is shortening the time needed to build new goods and improving the quality of software [7]. AI is being utilized in infrastructure management to automate processes like capacity planning, resource allocation, and network monitoring. This is contributing to increased IT infrastructure dependability and efficiency.

3.2   Artificial intelligence adaption using Learning and Development

Adoption of learning and development in artificial intelligence is becoming more and more crucial for companies and organizations. The world is changing quickly due to AI, and the L&D sector is no different [16]. Businesses using AI-powered L&D solutions can benefit from: Reskill and upskill their workforce: Artificial Intelligence may be leveraged to build individualized learning programs that give workers the tools they need to thrive in the AI-powered workplace. Boost employee engagement: Artificial Intelligence has the potential to make learning more dynamic and engaging, which will increase worker motivation and retention. Boost efficiency and productivity: Artificial Intelligence can automate processes and give real-time

feedback, enabling workers to operate more effectively and efficiently. Lower training expenses: By automating processes and offering individualized learning experiences, AI can assist in lowering training costs [17].

3.3   Employee Performance and productivity in Artificial intelligence adaption

The workplace is rapidly changing due to artificial intelligence, and productivity and employee performance are two important areas where AI is having a big impact. AI has several applications that can boost worker productivity and performance, including Task automation many of the time-consuming and repetitive operations that employees presently undertake can be automated with the help of AI. Artificial intelligence can be used to give workers performance feedback in real time. Employees can use this to pinpoint their areas of improvement and make the necessary corrections. Customizing education: AI can be utilized to tailor individual employee's learning experiences. Employee learning may benefit from this in a more effective and efficient way. Artificial intelligence can enhance human skills by giving workers the resources and tools they require to do their tasks more successfully.

3.4   Hypothesis development: -

Hypothesis 1: AI adoption has a positive impact on employee performance.
    [3]Adoption of AI encourages the development of a third kind of psychological contract that we refer to as "Alienation." Sustainable Development Goal 8, on the other hand, is based on enhancing the contractual relationships that exist between an organization and its workforce [4]. AI risk, inventiveness, competitive pressure, managerial support, and regulatory backing all have a big impact on how well AI adoption works. Elements that contribute to the beneficial effects include increased job performance overall, flexibility and autonomy in the workplace, and creativity and innovation [15]. Additional characteristics that have been recognized as contributing to employees' techno stress include work overload, job uncertainty, and complexity. By putting forth the AI capacity framework and fusing the ideas of resource-based view and knowledge-based view, the organizational resources need to realize commercial benefits [5]. From an HRM practitioner's perspective, our methodology provides a methodical approach for managers to objectively evaluate their own organizational preparedness and devise plans for embracing and executing AI-powered procedures and practices.

Hypothesis 2: AI adoption has a positive impact on L&D.
    Technology capabilities, organizational capabilities, and external task contexts all have a favorable effect on circular economy and AI practices [20]. According to the research, artificial intelligence technology may be able to change how things are produced and decrease how much of an impact industry has on the environment. the construction industry about the possibilities and challenges of artificial intelligence's flexibility and support in promoting the sector's adoption of AI methods [19]. The adoption of AI in manufacturing is primarily influenced by three organizational factors: corporate scale, R&D intensity, and digital skills. Furthermore, to get new insights into the

ways in which global production strategies and the uptake of new technologies interact [12].

Hypothesis 3: L&D mediates the relationship between AI adoption and employee performance.

AI may help learning processes become faster, more accurate, and more affordable for L&D professionals [2]. It can also make learning more flexible, efficient, comfortable, and affordable for learners—all while catering to a broad learning audience at once. The capacity approach, which teaches people and institutions how to promote human development through lifetime learning [18]. As people learn to produce value, move to give examples of how the technologies supporting workplace practices can be perceived with an emphasis on capabilities. Adoption of artificial intelligence plays a significant role when it is discovered that AI mediates the relationship between AI hiring and employer reputation, and AI quality and employer reputation play a similarly significant mediation role [13]. The adoption of AI by banks and all other service industry businesses; the requirement that all workers and individuals receive education regarding the significance of embracing AI; and the updating of school curricula at all levels in developing and third world economies to include AI and its ancillary devices [21].

4   RESEARCH MODEL AND METHODS

Qualitative methods and an exploratory research design were employed in the study. IT personnel from reputable Indian IT companies submitted the structured questionnaire data. A questionnaire with a 5-point Likert scale is used, and the snowball sampling technique is tailored. Pilot research of one hundred samples was conducted prior to the final data collection, and two pretests were given. As a result, the questionnaire's content validity can be established. Out of the 492 employees in the target group who got the questionnaire, 388 genuine responses were gathered. The researcher employed SEM using PLS, and software programs for Windows and statistical packages for social science were utilized to arrive at data analyses and movement structure analysis.
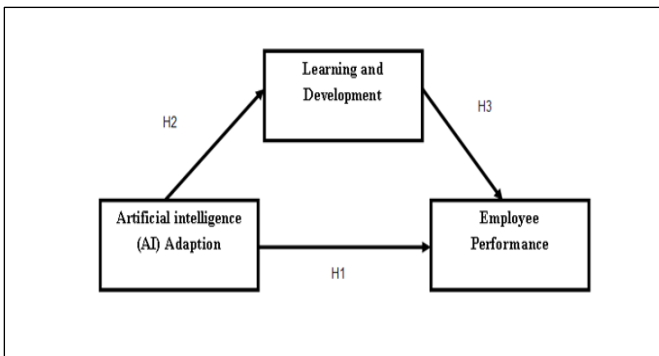

Fig. 1. Proposed Model- Artificial Intelligence in the IT Industry

4.1   Conceptual Framework

Fig 1: Proposed Model- Artificial Intelligence in the IT Industry Post-COVID-19 Epidemic and the role that employee learning and development plays in enhancing employee performance - A Mediation strategy.

4.2   Sample Profile

Table 1. - 1: Demographic Profile of Samples

Gender	Male	201	52%
	Female	187	48%
	Total	388	100%
Age	25 Below	69	18%
	Between 26-30	118	30%
	Between 31-35	64	16%
	Between 36-40	79	20%
	41 and above	58	15%
	Total	388	100%
Experiences in years	0-3	54	14%
	4-6	36	9%
	7-9	38	10%
	10-12	145	37%
	13 and above	115	30%
	Total	388	100%

The demographic profile of samples used in research articles is very important since it gives important information about the characteristics of the participants in the study. The demographic profile of the samples utilized in this study is shown in table 1 above. Researchers and readers can better understand the study's findings and determine how broadly applicable the findings are by looking at the demographic profile. It is imperative to ascertain whether the sample size employed in the research was sufficient. The researchers used the KMO test results to confirm that the sample size was appropriate for the investigation. >0.50, reference value for the KMO test. The observed value of KMO is.0.686, which is greater than what is needed. The results of the KMO test demonstrate that the chosen sample size is enough for the investigation.

5   RESULTS AND DISCUSSION

The COVID-19 pandemic has expedited the assimilation and assimilation of artificial intelligence in diverse industries, including the information technology sector. Businesses are looking more and more to artificial intelligence solutions to boost productivity, innovate, and streamline operations as they try to manage the pandemic's challenges. AI has been especially helpful in the IT sector in enabling remote work, streamlining workflows, and guaranteeing business continuity. The gathered data was analyzed using suitable statistical tools, such as descriptive statistics. Table 2 presents the results of Multiple regression.

Table 2. - 2: Multiple Regression Model Summaries

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.726ᵃ	.542	.371	.68281	.542	3.200	12	35	.003
a. Predictors: (Constant), *AI Adoption AIA-1, AIA-2, AIA-3, AIA-4,* Learning and Development, LD -1, LD -2, LD -3, LD -4, Employee Performance, EP-1, EP-2, EP-3, EP-4									

We can compare and justify the explanatory power of the model by using varying numbers of predictor variables. This will help us determine the appropriate number of variables for our regression model. The model revealed that the adjusted R-square value of 0.371 was lower than the R square value of 0.542, indicating that the addition of an additional independent variable could increase the complexity of the research model's proof.With the help of PLS model (PLS-SEM), the researcher assess the relationships between latent variables and observed indicators. Loading and cross-loading are important concepts within the measurement model are presented . In PLS-SEM, loadings represent the correlation between the latent variable and its indicator. High loading values (close to 1) indicate that the indicator is a good representation of the underlying latent construct. Cross-loading refers to the situation where an indicator loads significantly on more than one latent variable [14]. Cross-loadings are a concern because they can indicate potential issues with the measurement model.

Table 3. - 3: Cross-loadings and loadings for the measuring model

Indicators	Indicator loadings	t-values
AI Adoption		
Enhancement: AIA-1	0.93	112.10

Cybersecurity Strengthening AIA-2	0.81	264.52
Customer Experience Enhancement: AIA-3	0.91	81.62
Data Analysis and Insights AIA-4	0.87	99.73
learning and development		
Skill Enhancement and Adaptability: LD -1	0.86	127.96
Innovation and Problem-Solving: LD -2	0.84	132.02
Employee Engagement and Retention: LD -3	0.83	105.86
Career Progression and Organizational Growth: LD -4	0.83	160.65
Employee Performance	0.88	190.12
Task Automation: EP-1		
Efficiency: EP-2	0.87	195.66
Personalization: EP-3	0.86	142.11
Data-Driven Decision-Making: EP-4	0.87	172.55

The Cronbach alpha value, construct reliability, average variance extracted (AVE), and indicators loadings were used in PLS SEM to evaluate the outer model, or measurement model. The indication loadings in Table 3 ranged from 0.83 to 0.95 for every construct. At the 0.001% significance threshold, all of the indicator loadings were also significant. Artificial Intelligence's scope and components in the IT sector Upon COVID-19 Epidemic and the part learning and development for employees plays in improving the employee performance model.

Table 4. - 4: Construct Correlations, Mean, and Standard Deviation

Correlations	Mean	Std. Deviation	(1)	(2)	(3)
AI Adoption (1)	4.34	0.84351	1		
learning and development (2)	4.02	0.71038	.586**	1	
Employee Performance (3)	4.06	1.01325	.629**	.590**	1

** Correlation is significant at the 0.01 level (2-tailed).

It demonstrates the relationship between the extent and components of artificial intelligence in the IT sector following the COVID-19 pandemic and the role that employee learning and development plays in enhancing the employee performance model.

AI Adoption (1) and Employee Performance (3) have a very strong association, as indicated by the arrived values of r=.629; p<0.01. AI Adoption (1) and Learning and Development (2) have a r = 586; p<0.01 association. Employee Performance (3) and learning and development (2) have a r = 590; p<0.01 association. All of the constructs have reasonably acceptable reliability, as Table 4 demonstrates.

Table 5. - 5: Outcomes of the Constructions' Direct and Indirect Mediation

No.	Hypothesis	Evidence	Result
1	Hypothesis 1: AI adoption has a positive impact on employee performance.	Positives - Value T-statistic (2.362)> t-statistic values (± 1.96) Significant: statistical value of P-Value 0032 (under 0:05) (Positive and Significant)	H1 Supported
2	Hypothesis 2: AI adoption has a positive impact on L&D.	Positives - Value T-statistic (18.430)> t-statistic values (± 1.96) Significant: statistical value 0.010 P-Value (below 0:05) (Positive and Significant)	H2 Supported
3	Hypothesis 3: L&D mediates the relationship between AI adoption and employee performance.	Positives - Value T-statistic (24.079)> t-statistic values (± 1.96) Significant: statistical value 0.026 P-Value (below 0:05) (Positive and Significant	H3 Supported

AI adoption has a positive impact on employee performance, this is caused by statistical values T (2.362) > t-statistic (1.96). Then H1 accepted. Research indicates that the AI Adoption, Enhancement: AIA-1, Cyber security Strengthening AIA-2, Customer Experience Enhancement: AIA-3 and Data Analysis and Insights AIA-4 proven positive Direct effect on Employee Performance, Task Automation: EP-1, Efficiency: EP-2, Personalization: EP-3, Data-Driven Decision-Making: EP-4 so it is not surprising that more often we display the items for the show, then the AI adoption has a positive impact on employee performance. The T-Statistic for the hypothesis -2 is 18.430, which is greater than the critical T-Statistic values of ±1.96. This indicates that the relationship between AI adoption and L&D is statistically significant. The high T-Statistic value suggests a strong positive relationship between AI adoption and L&D. Significance Level: The significance level, often denoted as alpha (α), is typically set at 0.05 in hypothesis testing.

The information states that the statistical value is 0.010, which is below 0.05. This implies that the relationship between AI adoption, Enhancement: AIA-1, Cyber security Strengthening AIA-2, Customer Experience Enhancement: AIA-3 and Data Analysis and Insights AIA-4 proven positive Direct effect Learning and development, Skill Enhancement and Adaptability: LD -1, Innovation and Problem-Solving: LD -2, Employee Engagement and Retention: LD -3, and Career Progression and Organizational Growth: LD -4 is statistically significant at the 0.05 level, indicating a high level of confidence in the results. T-Statistic for Hypothesis 3 is 24.079, which is greater than the critical T-Statistic values of ±1.96. This suggests that the relationship between AI adoption and employee performance, mediated by L&D, is statistically significant. The high T-Statistic value implies a strong relationship between these variables. The statistical value is 0.026, indicating that the relationship is statistically significant at the 0.05 level, as the P-value is below 0.05. This suggests a high level of confidence in the findings. The conclusion of partial mediation indicates that while L&D partially mediates the relationship between AI adoption and employee performance, there may be other factors influencing this relationship as well. In this context, it implies that the impact of AI adoption on employee performance is partly direct and partly indirect through its effect on L&D initiatives. The results suggest that the adoption of AI impacts employee performance not only directly but also through its influence on the organization's learning and development practices. This highlights the importance of effective L&D strategies in maximizing the benefits of AI adoption for enhancing employee performance.

Table 6. – 6: Measurement of the Estimated Model's Fit Quality

Goodness-of-fit measure	$(x2)/DF$	GFI	RMSR	RMSEA	AGFI	NNFI	NFI
Estimated model	4.44	0.8	0.68	0.071	0.8	0.95	0.97
Reference Value	<5.0	≥.7	≤.1	≤.05 - .08	≥.9	≥.9	≥.9
Fitness	Good	Good	Good	Good	Good	Good	Good

The above table's results demonstrate how well the data match the model, with a P value > 0.05 (5% threshold of significance). Every dependent and independent variable that was selected for the research suited the model quite well. SEM was used to verify that there were no negative error variances, standardized coefficients, or other issues of that nature. [8] As demonstrated in Table -6, the goodness-of-fit index (0.8 ≥.7) indicates that the model fits the data well, with a chi-square value of 316, d.f. of 96, and a

good fit at the (4.44 <5.0) level. An excellent match is shown by the estimated model value of 0.68, which is ≤.1, and the root-mean-square residual, which should be <.1. The value of the adjusted goodness of fit index, which should be ≥.9, is 0.80, which denotes a marginal acceptability threshold. The resultant number is 0.071, with the root mean square error of approximation having a value between ≤.05 -.08. As a result, every fit measure shows that the theoretical framework model has an appropriate range and matches the data well. In light of the COVID-19 pandemic, artificial intelligence's components and use in the IT sector, as well as the role employee learning and development plays in enhancing the employee performance model, are discussed.

6   CONCLUSION

The COVID-19 pandemic has reshaped the IT industry, compelling organizations to accelerate the adoption of Artificial Intelligence (AI) to navigate the challenges posed by remote work, digital transformation, and evolving customer demands. Post-COVID-19, the impact of AI in the IT sector has been profound, fundamentally transforming operational strategies, customer engagement, and cybersecurity measures. This integration of AI has expedited the shift towards a more agile and technology-driven landscape within the industry. As AI continues to revolutionize the IT sector, the role of employee learning and development has become increasingly crucial in fostering a skilled workforce capable of leveraging AI tools and technologies effectively. In this context, employee learning and development initiatives serve as a catalyst for enhancing employee performance and fostering innovation within organizations. The adoption of AI is having a significant impact on the IT industry and on the work of IT employees. This literature review provides a background on the impact of AI in the IT industry post-COVID-19 epidemic and the role that employee learning and development plays in enhancing employee performance. The review also discusses the mediation strategy, which can be used to investigate the relationship between AI adoption and employee performance, mediated by L&D.

The findings of this study could provide valuable insights into how to enhance employee performance in the AI-powered IT workplace. All three hypotheses are accepted, the conclusion drawn from the analysis suggests a strong interconnectedness between AI adoption, employee performance, and the role of learning and development as a mediator in this relationship. The findings imply that the integration of AI within an organization positively influences both employee performance and L&D initiatives. Moreover, the role of L&D in facilitating the effective implementation and utilization of AI technologies among employees appears to be a critical factor in enhancing overall organizational performance. Consequently, the conclusion highlights the importance of investing in AI adoption and robust L&D programs simultaneously, as they mutually reinforce each other to foster a culture of continuous learning, innovation, and improved employee performance within the organization.

The findings underscore the need for organizations to prioritize the development of comprehensive strategies that leverage AI tools to enhance employee performance, while concurrently investing in L&D initiatives that aim to upskill employees and cultivate a workforce capable of effectively leveraging AI technologies for sustainable growth and success. Considering these findings, organizations are encouraged to promote a holistic approach that integrates AI adoption with targeted L&D interventions, creating a synergistic environment that empowers employees to adapt to technological advancements, drive innovation, and achieve optimal performance outcomes. This approach can contribute to building a competitive advantage, fostering employee engagement and satisfaction, and positioning the organization at the forefront of industry innovation and development. This information could be used by organizations to develop more effective L&D programs and to create a more supportive and productive work environment for all employees.

7   IMPLEMENTATION

IT companies must fund for the employees learning. The unique demands of the company and its personnel should be considered when designing L&D programs. Companies ought to foster a culture of growth and learning as well. This entails giving staff members the tools and encouragement they need to continue learning and acquiring new abilities. Businesses may guarantee that their staff members have the abilities and know-how required to thrive in the AI-powered workplace by making investments in learning and development. Employee performance will increase as a result, and the organization will succeed.

8   LIMITATIONS AND FUTURE RESEARCH AVENUES

The results may not be indicative of the wider national or even international IT industry because the study only looked at IT employees in Bangalore. The use of a snowball sampling method can introduce a bias in the sample selection process. This method heavily relies on referrals and recommendations from initial participants, potentially leading to the exclusion of individuals or groups who are not part of the initial network. As a result, the sample may not accurately represent the diversity of perspectives within the broader IT industry. Concentrating solely on IT employees in Bangalore may overlook the diversity of experiences and perspectives that exist in other regions or sectors. Different geographical locations and industry segments could exhibit distinct patterns of AI adoption, employee learning, and development, which were not accounted for in the study. To improve the robustness and applicability of the study, future research endeavors could consider widening the geographical scope, employing more diverse sampling methods, and accounting for various external and internal factors that could influence the identified relationships. Conducting longitudinal studies helps in long-term implications of AI adoption and L&D on employee performance within the IT industry.

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