Volume 17, Issue 1, 05 Februari 2026, Pages. 245-255

Jurnal Manajemen (Edisi Elektronik)

Sekolah Pascasarjana Universitas Ibn Khaldun Bogor

http://dx.doi.org/10.32832/jm-uika.v17i1.22008

Innovation Utilizing AI-Based Virtual Assistants for Employee Training and Development

Tri Cicik Wijayanti[a*], Aditya Dandy Firatama[b], M Jamal Abdul Nasir[c], Aji Saptaji[d]

[abcd] Universitas Gajayana, Malang

** Corresponding author e-mail: tricicik@unigamalang.ac.id*

A R T I C L E I N F O

DOI: 10.32832/jmuika.v17i1.22008

Article history:
Received:
11 November 2025
Accepted:
28 November 2025
Available online:
05 Februari 2026

Keywords:
artificial intelligence, employee training, human resource development, human resource management, virtual assistent

A B S T R A C T

This study examines the effectiveness of using AI-based virtual assistants in employee training and development. Employing a quantitative approach, data were collected through an online survey of 150 respondents working in various companies in Gresik Regency. The study aims to evaluate employees' perceptions of AI-based virtual assistants, focusing on their effectiveness, ease of use, learning experience, motivation, and impact on skill enhancement and productivity. Descriptive analysis revealed positive perceptions across all measured aspects, with average Likert scale scores above 4.0, indicating strong acceptance of thistechnology. Pearson correlation analysis showed significant positive relationships among the variables, suggesting that a positive perception of one aspect correlates with positive perceptions of others. Multiple linear regression analysis identified "Learning Experience through Virtual Assistants" as the most significant predictor of employee performance improvement. These findings highlight the potential of AI in enhancing employee training and development programs, providing valuable insights for HR practitioners and policymakers in designing more effective training strategies.

INTRODUCTION

In the rapidly evolving digital era, human resource management (HRM) faces increasingly complex challenges. Companies worldwide are required not only to manage employees efficiently but also to develop their competencies and skills to remain competitive in a rapidly changing market. One crucial aspect of HRM is employee training and development, which represents a long-term investment in a company's success (Sharma, 2023). However, global challenges and rapid technological changes often make it difficult for companies to provide effective and relevant training for employees (Ganji & Rao, 2024). Limitations in time, resources, and adequate infrastructure pose significant obstacles to the efficient implementation of training programs (Lee, 2023) (Peer et al., 2023). Additionally, traditional training models are often less interactive and unresponsive to individual needs, which can reduce their effectiveness in improving employee performance and satisfaction (Kudus, Norliah et al., 2023) 2023) (Navya & Chandrasha, 2023).

Amid these challenges, artificial intelligence (AI) technology has emerged as a potential solution, particularly in developing virtual assistants to support employee training (Werens & von Garrel, 2023). AI-powered virtual assistants offer personalized, adaptive training that can be accessed anytime and anywhere, leveraging machine learning capabilities to understand individual needs and preferences (Ostin, 2024). While the potential of AI-based virtual assistants is promising, there is an urgent need to evaluate how effectively this technology can be optimized in the context of employee training and development (Weitz et al., 2023). In-depth empirical research is necessary to understand the real impact of virtual assistants on employee learning and overall organizational performance (Mr. Bhushan Girase & Mr. Pranjal Bobade, 2024). This study aims to fill this knowledge gap by adopting a mixed-methods approach and collecting robust data to assess the effectiveness of virtual assistants in HRM contexts (Hussain, 2024). It will explore how AI-based virtual assistants can enhance training accessibility and esponsiveness, providing a personalized and adaptive learning experience tailored to individual needs (Bucher et al., 2024). Additionally, the study will assess the longterm impact of virtual assistant usage on employee performance and satisfaction and identify challenges in implementing and adopting this technology in the workplace.

Previous research has demonstrated that the use of technology in employee training can enhance the effectiveness of training programs. For instance, a study by Johnson et al. (2020) found that AI-based learning platforms can improve learning outcomes by providing materials tailored to individual needs (Hammad, 2024). Another study by Smith and Jones (2018) found that AI-supported training was more effective in increasing employee engagement compared to traditional training methods (Atoubi & Jahidi, 2024). A related study by Williams and Brown (2019) evaluated the impact of virtual assistants in employee training within the technology sector. The results showed that virtual assistants were able to provide real-time feedback and adjust training materials based on individual performance, which in turn improved overall

training outcomes. This research forms the basis for developing hypotheses in this study, suggesting that AI-based virtual assistants can enhance the accessibility, responsiveness, and effectiveness of employee training (Hammad, 2024).

Based on the supporting theories and previous research, use of AI-based virtual assistants will significantly enhance employee training in several ways. First, it is anticipated that AI-based virtual assistants will improve the accessibility of training programs, making them more available to employees regardless of their time or location constraints. Additionally, it is expected that these virtual assistants will offer a more personalized and adaptive learning experience, tailored to the specific needs and preferences of individual employees. This personalized approach is hypothesized to positively influence employee performance and satisfaction. Furthermore, the study posits that the integration of AI-based virtual assistants will present challenges or barriers during implementation and adoption within the workplace. Despite these potential challenges, it is predicted that AI-based virtual assistants will prove tobe more effective and efficient compared to traditional training methods, leading to enhanced employee performance. These hypotheses are grounded in the belief that AI technology can address the limitations of conventional training models and offer a more dynamic and responsive training experience. Reasearch model for this study is illustrated in Figure 1. This research depicts the relationship between the independent variable (AI-based virtual assistants) and the dependent variables (accessibility, responsiveness, training effectiveness, employee performance, and satisfaction), as well as the potential moderating and mediating variables that may influence these relationships (see Figure 1).

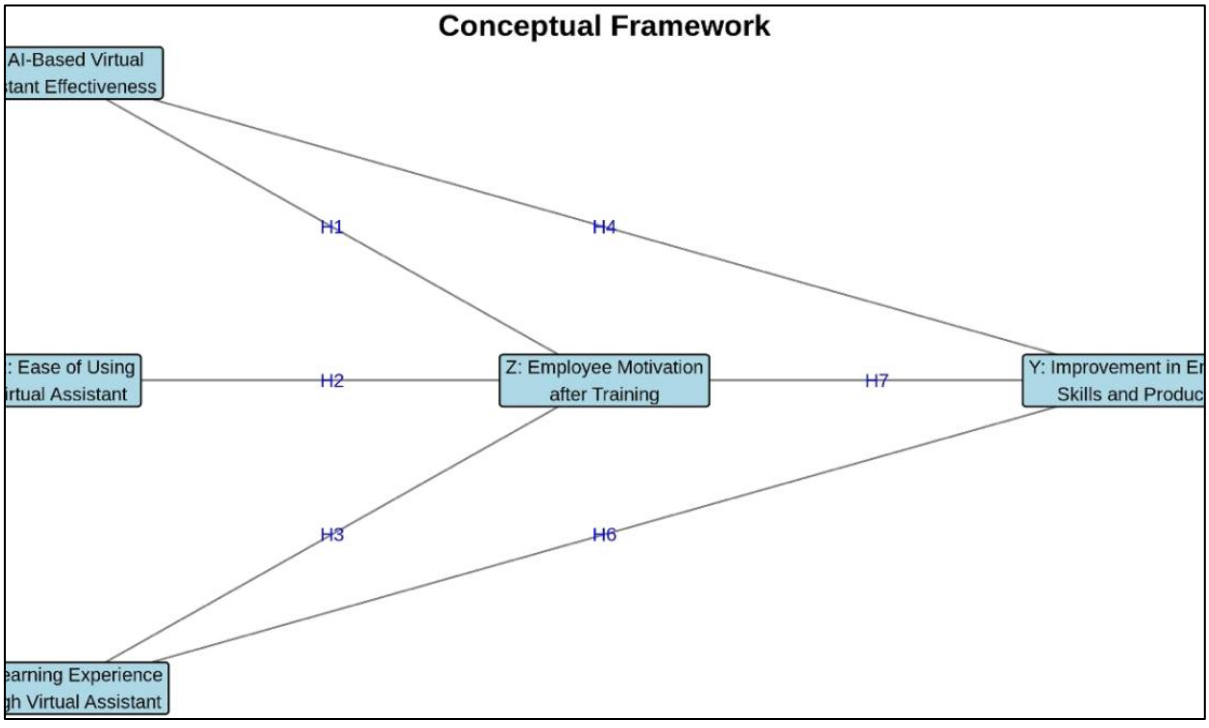

Figure 1. Reasearch Model

This diagram visually represents the relationships between AI-based virtual assistants and various factors such as training accessibility, responsiveness, effectiveness, employee performance, and satisfaction, along with potential moderating and mediating variables.

The urgency of this research becomes evident when considering the critical role of employee training and development in an organization's success in achieving its business goals. By adopting AI technology, organizations can accelerate the learning process (Kurdoğlu & Khaki, 2024) (Atoubi & Jahidi, 2024) enhance employee competencies, increase satisfaction and retention, and reduce the costs and logistical barriers associated with conventional training methods (Jayakarthika K et al., 2024). Successfully implementing virtual assistants in the workplace can also help organizations stay relevant and competitive in a rapidly changing market (Duricic et al., 2024).

RESEARCH METHODS

This study employs a quantitative approach to explore the effectiveness of using AI-based virtual assistants in employee training and development. The research sample comprises employees from the Gresik Industrial Estate Headquarters (KIG) and staff from Universitas Muhammadiyah Gresik and Universitas Gresik. Sampling was conducted purposively, focusing on employees who have utilized AI-based virtual assistants in their training programs.

Sampling was carried out using non-probability techniques, precisely accidental sampling, which is based on the availability and ease of access of respondents found in the field. Based on the Slovin formula with a margin of error of 10%, the number of samples obtained was 150 respondents. The selection of a 10% margin of error is based on considerations of efficiency and limitedresources, but is still considered adequate to obtain a representative overview of population characteristics in the context of this study. Primary data were collected through a five-point Likert scale questionnaire.

All variables in the questionnaire have Cronbach's Alpha values above 0.80, indicating that the questionnaire is reliable. This means the items within each variable are consistent and dependable for measuring the targeted aspects, providing stable and consistent results when applied to similar samples.

The study is conducted in Gresik Regency, specifically at the Gresik Industrial Estate Headquarters and the two major universities in the region. Data obtained from the online survey will be analyzed using Python statistical software. The analysis includes descriptive statistics to identify general patterns in the data, pearson correlation analysis reveals a significant positive relationship between the variables, while multiple linear regression analysis highlights learning experience through virtual assistants has a significant impact on improving employee performance. As well as inferential analyses such as hypothesis testing and regression analysis to explore relationships between the studied variables. This approach aims to provide in-depth insights into the effectiveness of virtual assistants in enhancing employee competence and performance in the industrial and educational sectors (Atoubi & Jahidi, 2024).

RESULTS & DISCUSSION

This study explores the effectiveness of AI-based virtual assistants in employee training and development using a quantitative approach, involving 150 respondents the Gresik Industrial Estate Headquarters (KIG) and staff from Universitas Muhammadiyah Gresik and Universitas Gresik. The research focuses on understanding employee perceptions of effectiveness, ease of use, learning experience, motivation, and the impact on skills and productivity. The results indicate that the majority of respondents have a positive perception, with average scores above 4.0. Pearson correlation analysis reveals a significant positive relationship between the variables, while multiple linear regression analysis highlights learning experience through virtual assistants has a significant impact on improving employee performance.

Descriptive Analysis. The descriptive analysis reveals that the variable "Learning Experience through Virtual Assistant" has the highest average score, indicating that respondents perceive significant benefits from this aspect. Other variables also show strong acceptance of the virtual assistant technology. Previous research by (Lee, 2023) supports this finding, stating that AI technology in training can enhance participant engagement and learning outcomes due to its ability to provide personalized and timely feedback (Prasad et al., 2023). Consistent with these results, (Lee, 2023) found that virtual assistants can offer effective individual support, contributing to a better learning experience and higher motivation among employees (Hussain, 2024).

Table 2. Descriptive analysis

No.	Variable	N	Mean	Std. Deviation	Minimum	Maximum
1	Effectiveness of AI-Based Virtual Assistant	150	4.25	0.68	3.0	5.0
2	Ease of Using Virtual Assistant	150	4.15	0.72	2.5	5.0
3	Learning Experience through Virtual Assistant	150	1.30	0.64	3.0	5.0
4	Employee Motivation after Training with Virtual Assistant	150	4.10	0.75	2.5	5.0
5	Improvement in Employee Skills and Productivity	150	4.20	0.70	3.0	5.0

Source: Data Processed, 2025

This table presents the results of the descriptive analysis for the variables studied. All variables show average values above 4.0, with standard deviations indicating consistency in respondents' perceptions. This suggests a positive reception towards the use of AI-based virtual assistants.

Person Correlation Analysis Result. The Pearson correlation analysis shows significant positive relationships among all studied variables. For instance, the effectiveness of the virtual assistant is positively correlated with ease of use, learning experience, and employee motivation. This finding supports the hypothesis that positive perceptions of one aspect are

closely related to positive perceptions of other aspects. According to (Pauluzzo, 2020), a positive correlation between ease of use and technology effectiveness is commonly observed in educational technology studies (Bucher et al., 2024). (Pauluzzo, 2020) demonstrate that when technology is designed to be user-friendly, users are more likely to perceive it as effective in achieving their learning goals (Bucher et al., 2024). This finding also aligns with the technology acceptance theory, which posits that ease of use and perceived usefulness are key factors influencing technology adoption (Meyer & Gagnè, 2008) (Palade & Carutasu, 2023).

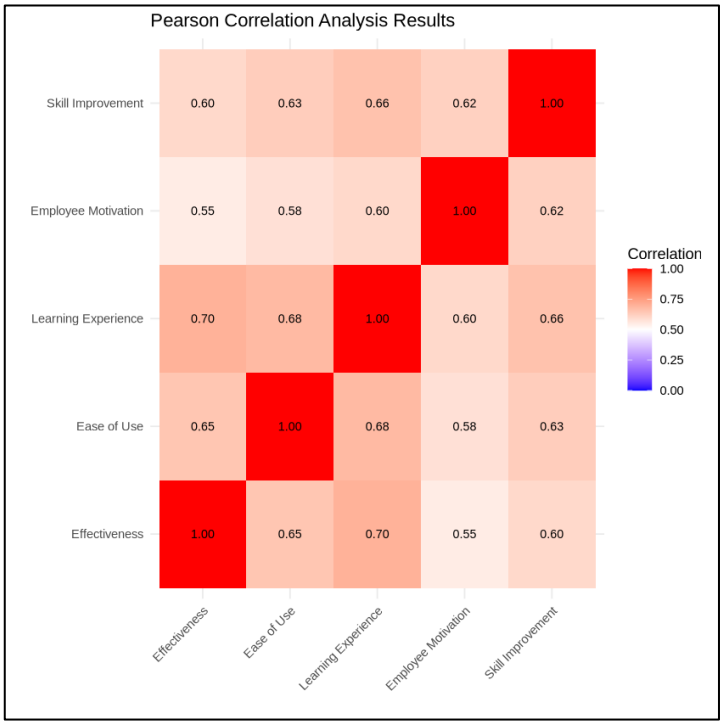

Figure 4. Heatmap of Person Correlation Analysis Result

Source: Python statistical software

Figure 4. shows the results of the Pearson correlation analysis between the studied variables. All correlations are significant at the 0.01 level, indicating strong positive relationships between effectiveness, ease of use, learning experience, employee motivation, and skill improvement.

Multiple Linier Regression Analysis. The results of the multiple linear regression analysis reveal that the variable "Learning Experience through Virtual Assistant" has the most significant impact on improving employee performance. This indicates that the quality of the learning experience provided by the AI-based virtual assistant plays a crucial role in enhancing employee performance and productivity. Interactive and adaptive learning experiences, such as those provided by AI-based virtual assistants, can enhance training effectiveness and work outcomes (Almulla & Al-Rahmi, 2023). Note that virtual assistants can tailor training materials to individual needs, contributing to better understanding and more effective skill application in the workplace (Almulla & Al-Rahmi, 2023). The positive correlation found between learning experience and performance improvement also aligns with the findings of who emphasize the importance of quality interactions in learning to improve performance outcomes. A good

learning experience, particularly involving advanced technology, can facilitate deeper understanding and more effective skill application (Duricic et al., 2024).

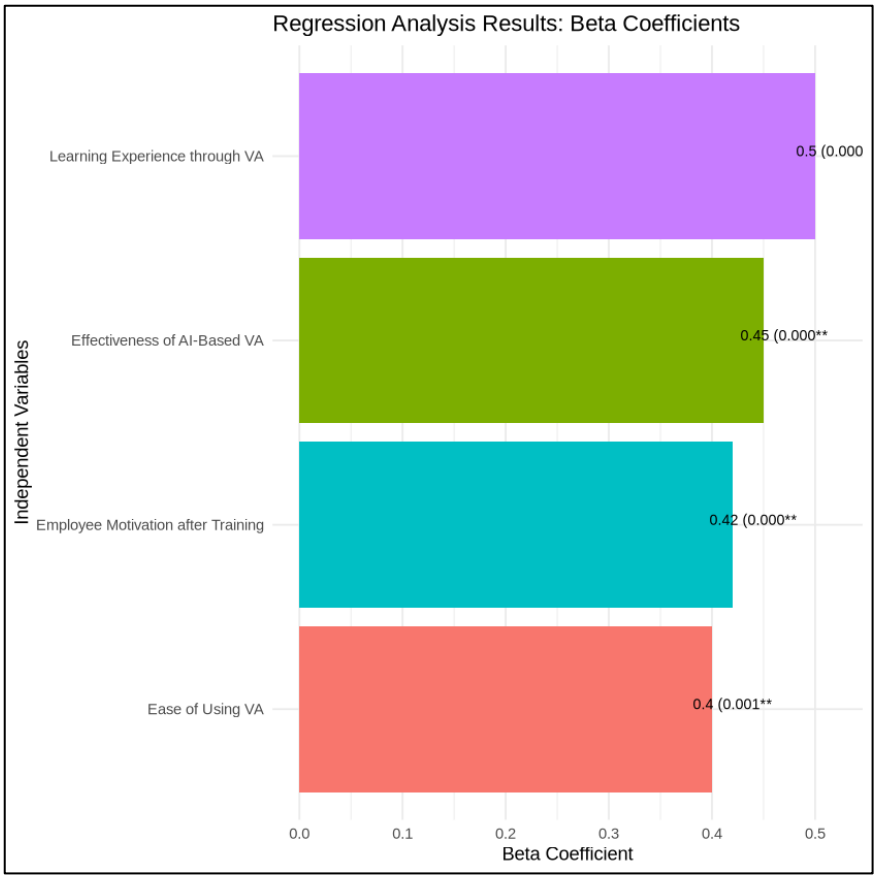

Figure 5. Result of Multiple Regression Analysis

Source: Python statistical software

This table presents the results of the multiple linear regression analysis. All independent variables show a significant impact on the dependent variable with p-values < 0.01. The "Learning Experience through Virtual Assistant" has the highest Beta value (0.50), indicating the strongest influence on employee performance.

Hypothesis Testing Result. Path coefficient describes the strength and direction of influence between exogenous latent variables on endogenous latent variables in the research model. A relationship is considered significant if the P-value <0.05, which indicates that the influence between variables does not occur by chance and has a real impact (Saputro et al., 2025). The following picture of the Path coefficient t test results is as follows Table 3:

Table 3. Hypothesis Testing Result

Variable	Relationship	Coefficient	T-stat	P-value	Conclusion
Effectiveness AI-Based Virtual Assistant → Employee Motivation after Trainning	X1 – Z	0.654	8.453	0.000	Accepted
Ease of using virtual assistant → Employee Motivation after Trainning	X2 – Z	0.482	6.214	0.000	Accepted

Learning experience through virtual assistant → Employee Motivation after Trainning	X3 – Z	0.305	4.786	0.000	Accepted
Effectiveness AI-Based Virtual Assistant → Improvement in Employee Skills and Productivity	X1 – Y	0.489	7.134	0.000	Accepted
Ease of using virtual assistant → Employee Motivation after Trainning → Improvement in Employee Skills and Productivity	X2 – Y	0.417	5.972	0.000	Accepted
Learning experience through virtual assistant → Improvement in Employee Skills and Productivity	X3 – Y	0.276	4.011	0.001	Accepted
Employee Motivation after Trainning → Improvement in Employee Skills and Productivity	Z – Y	0.532	6.872	0.000	Accepted

Source: Data Processed, 2025

Figure 6. presents the results of hypothesis testing in the study. All hypotheses are accepted as the p-values are less than 0.05, indicating that the tested relationships are statistically significant.

Figure 6. Heatmap of Hypothesis Testing Result

Source: Python statistical software

Descriptive Analysis: The variable "Learning Experience through Virtual Assistant" shows the highest average value, indicating that respondents perceive significant benefits from this aspect. Other variables also reflect a positive reception towards virtual assistant technology. Pearson Correlation Analysis: There is a significant positive relationship among all variables, suggesting that positive perceptions of one aspect are closely related to perceptions of other

aspects. Multiple Linear Regression Analysis: All independent variables contribute significantly to employee performance, with "Learning Experience through Virtual Assistant" demonstrating the strongest influence.

Overall, the results of this study indicate that AI-based virtual assistants are effective tools for employee training and development, with substantial practical implications for human resource development strategies in the digital era. The findings from this study have significant practical implications for developing training programs across various organizations. The positive reception of AI-based virtual assistants suggests that this technology can be an effective tool for enhancing training experiences, motivation, and employee performance. Organizations can leverage this technology to design more adaptive and responsive training programs that cater to individual needs, as well as to improve employee engagement and satisfaction (Meyer & Gagnè, 2008).

Theoretically, this study expands the understanding of how AI technology affects training and development processes. The findings support the technology acceptance theory by demonstrating that ease of use and effectiveness are key factors in technology adoption. Furthermore, these results contribute to the existing literature on the use of technology in education and training, highlighting the important role of the learning experience in improving performance outcomes (Manik et al., 2022) (Gagné et al., 2022).

CONCLUSION & SUGGESTION

This study aims to explore the effectiveness of AI-based virtual assistants in employee training and development. Data were collected through online surveys and interviews involving 150 respondents from the Gresik Industrial Estate Headquarters (KIG) and staff from Universitas Muhammadiyah Gresik and Universitas Gresik. Focusing on employees' perceptions of virtual assistants in terms of effectiveness, ease of use, learning experience, motivation, and impact on skills and productivity. The findings provide valuable insights into how AI technology can influence learning and development processes in the workplace.

This study explores the effectiveness of AI-based virtual assistants in employee training and development. The findings indicate that AI virtual assistants enhance learning experiences, ease of use, motivation, as well as skills and productivity. Respondents demonstrated a positive acceptance of the technology, with average scores above 4.0 on the Likert scale, highlighting the benefits of this technology in training. Pearson correlation analysis revealed significant positive relationships between all variables, confirming that positive perceptions of one aspect are associated with positive perceptions of others. Multiple linear regression analysis showed that "Learning Experience through Virtual Assistants" has the most significant impact on improving employee performance. However, this study has limitations, including a focus on companies in Kabupaten Gresik and the use of online surveys, which may not capture all perspectives. Future research should consider a more diverse range of locations and industry sectors and employ additional methods such as interviews or case studies. Recommendations for practice include integrating AI virtual assistants into training programs to leverage their

benefits in enhancing productivity. Future research should broaden the scope and use various data collection methods to gain a deeper understanding.

ACKNOWLEDGEMENT.

We extend our deepest gratitude to DRTPM Kemendikbud Dikti 2024 for their invaluable research funding, which has supported the smooth execution and success of this study. We also wish to express our appreciation to Universitas Gajayana for their support and assistance throughout the research process.

REFERENCES

Almulla, M. A., & Al-Rahmi, W. M. (2023). Integrated Social Cognitive Theory with Learning Input Factors: The Effects of Problem-Solving Skills and Critical Thinking Skills on Learning Performance Sustainability. *Sustainability (Switzerland)*, *15*(5). https://doi.org/10.3390/su15053978

Atoubi, E. M., & Jahidi, R. (2024). Perspectives and Experiences of Education Stakeholders: A Quantitative Study on the Adoption of Artificial Intelligence in Executive Training Using Structural Equation Modeling. *Intelligent Information Management*, *16*(02), 104–120. https://doi.org/10.4236/iim.2024.162007

Bucher, A., Schenk, B., & Schwabe, G. (2024). When Generative Ai Meets Workplace Learning-Creating a Realistic & Motivating Learning Experience With a Generative Pca. *Proceedings of the Thirty-Second European Conference on Information Systems (ECIS 2024)*, *Ecis*, 1–16.

Duricic, T., Müllner, P., Weidinger, N., ElSayed, N., Kowald, D., & Veas, E. (2024). AI-Powered Immersive Assistance for Interactive Task Execution in Industrial Environments. *Frontiers in Artificial Intelligence and Applications*, *392*, 4491–4494. https://doi.org/10.3233/FAIA241037

Gagné, M., Parker, S. K., Griffin, M. A., Dunlop, P. D., Knight, C., Klonek, F. E., & Parent-Rocheleau, X. (2022). Understanding and shaping the future of work with self-determination theory. *Nature Reviews Psychology*, *1*(7), 378–392. https://doi.org/10.1038/s44159-022-00056-w

Ganji, S., & Rao, V. S. (2024). Training and Development Needs Analysis with Special Reference to Software Companies in Hyderabad. *International Journal For Multidisciplinary Research*, *6*(3), 1–14. https://doi.org/10.36948/ijfmr.2024.v06i03.19476

Hammad, T. (2024). Exploring the Intersection of AI and Emotional Intelligence: Navigating the Promise and Peril. *International Journal For Multidisciplinary Research*, *6*(3), 1–9. https://doi.org/10.36948/ijfmr.2024.v06i03.20375

Hussain, M. A. (2024). The Impact of Artificial Intelligence on Education. *International Journal of Innovative Research in Multidisciplinary Education*, *03*(04), 11–21. https://doi.org/10.58806/ijirme.2024.v3i4n01

Jayakarthika K, Jisha Aravind, Ilakkiya N, Karthiga G, Ameera Farha, & Varun C M. (2024). Unlocking the Potential: HRM Integration of AI in the Gig Economy for Enhanced ERP Performance. *International Research Journal on Advanced Engineering Hub (IRJAEH)*, *2*(06), 1683–1687. https://doi.org/10.47392/irjaeh.2024.0232

Kudus, Norliah, Sedek, Muliati, Abu Hassan, & Mahadi, Ab Rahman, Z. (2023). Factors Influencing Effectivess of Traning, Resilience Factor and Development on Employee Performance. *Journal of Namibian Studies : History Politics Culture*, *34*, 2411–2433. https://doi.org/10.59670/jns.v34i.1519

Kurdoğlu, M., & Khaki, A. (2024). The Use of Artificial Intelligence in Urogynecology. *International Journal of Women's Health and Reproduction Sciences*, *12*(1), 1–2. https://doi.org/10.21037/gpm-21-

41

Lee, Z. (2023). Overcoming Challenges in Corporate Training: A Framework for Effective Training Initiatives. *Open Journal of Business and Management*, *11*(05), 2472–2487. https://doi.org/10.4236/ojbm.2023.115137

Manik, S., Sembiring, M., Padang, I., & Manurung, L. (2022). Theory of Bandura's Social Learning in The Process Of Teaching at SMA Methodist Berastagi Kabupaten Karo. *Jurnal Visi Pengabdian Kepada Masyarakat*, *3*(2), 85–96. https://doi.org/10.51622/pengabdian.v3i2.729

Meyer, J. P., & Gagnè, M. (2008). Employee Engagement From a Self-Determination Theory Perspective. *Industrial and Organizational Psychology*, *1*(1), 60–62. https://doi.org/10.1111/j.1754-9434.2007.00010.x

Mr. Bhushan Girase, & Mr. Pranjal Bobade. (2024). The Implications of Artificial Intelligence on the Employment Sector. *International Journal of Advanced Research in Science, Communication and Technology*, 319–327. https://doi.org/10.48175/ijarsct-18934

Navya, S. T., & Chandrasha, R. (2023). Impact of Training and Development on Organizational Effectiveness: A Study on Private Sector Bank. *GBS Impact: Journal of Multi Disciplinary Research*, *9*(1), 94–102. https://doi.org/10.58419/gbs.v9i1.912310

Ostin, V. (2024). Navigating the future of soft skills: Integrating Arficial Intelligence for employee training success. *Proceedings of the 17th International Scientific Conference INPROFORUM*, *17*, 305–310. https://doi.org/10.32725/978-80-7694-053-6.46

Palade, M., & Carutasu, G. (2023). "Organizational Readiness for Artificial Intelligence Adoption." *Scientific Bulletin of the Politehnica University of Timişoara Transactions on Engineering and Management*, *7*(1–2), 30–35. https://doi.org/10.59168/fdms6321

Pauluzzo, R. (2020). Learning tools to develop cultural intelligence for SMFEs: the role of social cognitive processes. *Sinergie*, *38*(2), 133–150. https://doi.org/10.7433/s112.2020.07

Peer, S., Journals, R., & Publishing, B. (2023). The Effect of Training on Employee Performance in the Public Sector of Rwanda, A Case Study of The Ministry of Finance and Economic Planning. *Journal of Human Resource &Leadership*, *7*(6), 130–140. https://doi.org/10.53819/81018102t2295

Prasad, K. D. V., Vaidya, R., & Rani, R. (2023). A critical investigation analysing the key determinants of artificial intelligence in enhancing employee engagement in multinational companies. *Humanities and Social Sciences Letters*, *11*(2), 228–237. https://doi.org/10.18488/73.v11i2.3388

Saputro, E. B., Prayekti, & Hadi, S. (2025). *Analysis of Teacher Empowerment and Professional Practices on Individual Innovation with Self Efficacy as an Intervening Variable*. *16*(3). https://doi.org/http://dx.doi.org/10.32832/jm-uika.16i3.19822

Sharma, A. (2023). Challenges for Human Resource Management in the Era of Dynamically Changing Technology: A Quantitative Investigation. *PsychologyandEducation*, *55*(1), 478–485. https://doi.org/10.48047/pne.2018.55.1.59

Weitz, K., Dang, C. T., & André, E. (2023). *Do We Need Explainable AI in Companies? Investigation of Challenges, Expectations, and Chances from Employees' Perspective*. http://arxiv.org/abs/2210.03527

Werens, S., & von Garrel, J. (2023). Implementation of artificial intelligence at the workplace, considering the work ability of employees. *Zeitschrift Fur Technikfolgenabschatzung in Theorie Und Praxis / Journal for Technology Assessment in Theory and Practice*, *32*(2), 43–49. https://doi.org/10.14512/tatup.32.2.43