AI BASED TRAINING NEEDS AND SKILL GAP ANALYSIS: READLINESS AND FRAMEWORK STUDY WITH A SPECIAL REFERENCE TOUNITED CARBON SOLUTIONS PRIVATE LIMITED, KANGEYAM, TIRUPUR DISTRICT

Dr.B.Shanthini,
Associate Professor, Department of Management Studies, Kangeyam Institute of Technology, Kangeyam- 638108, Tamilnadu, India.

R.Raguvaran,
II-MBA,
Department of management Studies, Kangeyam Institute of Technology, Kangeyam- 638108, Tamilnadu, India.

ABSTRACT

Artificial Intelligence (AI) is increasingly transforming organizational operations and workforce development, creating a need for employees to acquire new skills and adapt to AI- driven work environments. This study focuses on identifying employee training needs and analyzing skill gaps related to the adoption of AI technologies in the workplace. A descriptive research design was adopted, and primary data were collected from 120 respondents using a structured questionnaire through Google Forms with convenience sampling. Statistical tools such as descriptive statistics, frequency analysis, correlation, regression, and ANOVA were used to analyze the data. The results show that employees recognize certain areas of skill gaps and moderately believe that AI can help identify these gaps. However, correlation analysis indicated a very weak negative relationship between the variables ($r = -0.047$), and regression and ANOVA results revealed that the relationship is not statistically significant ($p > 0.05$). The findings suggest that while AI has the potential to support organizations in identifying skill gaps, its effectiveness depends on proper implementation, employee awareness, and adequate training programs to improve digital skills and readiness for AI-based work environments.

Keywords: Artificial Intelligence, Technologies, Employees, Relationship, Effectiveness.

INTRODUCTION

In the contemporary digital era, Artificial Intelligence (AI) has emerged as a transformative technology that is reshaping the way organizations operate, make decisions, and develop their workforce. Many organizations are increasingly integrating AI-driven systems into various business functions such as recruitment, performance management, learning, and development, which requires employees to adapt to new technologies and acquire updated skills to remain productive and competitive in the workplace. However, the rapid adoption of AI technologies has created challenges for organizations in identifying the existing skill levels of employees and determining the training required to bridge the gap between current competencies and future job requirements. Training Needs Analysis and Skill Gap Analysis play a crucial role in helping organizations understand the competencies employees currently possess and the skills they need to effectively work in an AI-driven environment. Traditional methods of training assessment may not always be sufficient to address the dynamic changes brought about by AI technologies, which highlights the need for AI-based approaches to identify training requirements and analyze skill gaps within the workforce. AI-based training systems can analyze large volumes of employee data, learning patterns, and competency levels to provide personalized training recommendations that help organizations design targeted training programs and enhance employee capabilities. Therefore, assessing the readiness of employees to adopt AI technologies is essential for ensuring successful implementation and supporting continuous learning and organizational development.

STATEMENT OF THE PROBLEM

Artificial Intelligence (AI) is becoming an important technology for organizations to improve efficiency, productivity, and decision-making. However, many organizations face several challenges in adopting AI technologies effectively. One of the major problems is the high cost of implementing AI systems, including expenses related to infrastructure, software, and maintenance. Another challenge is that many organizations have not previously used AI technologies, which creates uncertainty and lack of familiarity among employees and management. In addition, the lack of skilled employees and technical knowledge is a major barrier for organizations in adopting AI systems successfully. Due to the absence of proper training and experience, employees may find it difficult to use AI tools effectively in their work.

These issues create a gap between the technological requirements of organizations and the existing capabilities of employees. Therefore, it is important to analyze the training needs of employees, identify the skill gaps, and assess their readiness to adopt AI technologies in order to support effective implementation and improve organizational performance.

OBJECTIVES

- To identify the skill gaps of employees in using Artificial Intelligence technologies in the workplace.
- To analyze the training needs required for employees to effectively adapt to AI-based work environments.

REVIEW OF LITERATURE

- Bessen (2015) examined the relationship between technological advancement and workforce skills. The study found that the adoption of advanced technologies creates new skill requirements in organizations, which increases the need for employee training and continuous skill development to improve productivity and reduce skill gaps.DOI: https://doi.org/10.2139/ssrn.2690432

- Brynjolfsson and McAfee (2017) discussed the impact of digital technologies and artificial intelligence on the future of work. The authors emphasized that technological change requires employees to continuously upgrade their knowledge and skills, and organizations must provide appropriate training programs to help employees adapt to new technologies.
- Davenport and Ronanki (2018) studied how organizations adopt artificial intelligence technologies to improve business operations and decision-making processes. The study highlighted that successful AI implementation depends on employee skills and training, which play a key role in supporting organizational performance.DOI: https://doi.org/10.1016/j.jbusres.2017.11.010

- Archana and Gerald (2023) analyzed the role of artificial intelligence in employee training and development within organizations. The study found that AI-based training systems can improve employee performance, decision-making ability, and productivity through intelligent learning solutions and personalized training approaches.
- López-Cabrera et al. (2024) conducted a systematic literature review on the use of artificial intelligence in professional development and talent management. The study concluded that AI-driven systems can effectively identify skill gaps, analyze employee performance, and recommend personalized training programs for workforce development. DOI: https://doi.org/10.1016/j.jjimei.2024.100288

- Ramachandran et al. (2024) examined the application of AI-based training programs to enhance employee skills and workplace efficiency. The findings revealed that AI technologies support personalized learning and help organizations design targeted training programs to improve employee competencies.

- Sidhu et al. (2024) studied the growing skill gap associated with AI adoption in organizations. The research identified that rapid technological advancements create a mismatch between existing employee skills and the competencies required for AI-based work environments.
- Jagad (2024) investigated employee readiness for artificial intelligence adoption by focusing on digital literacy, training opportunities, and organizational support. The study concluded that continuous training and skill development are essential to prepare employees for AI-enabled workplaces. DOI: https://doi.org/10.33122/ejeset.v6i1.963
- Savelka et al. (2025) examined the development of rapid occupational training programs aimed at preparing employees for AI-driven workplaces. The study emphasized the importance of flexible and continuous training frameworks to support workforce adaptation to emerging technologies.
- Bogart et al. (2025) proposed an AI literacy assessment model to evaluate employees' ability to effectively use artificial intelligence tools in real-world work environments. The study highlighted that developing AI literacy through structured training programs is essential for building an AI-ready workforce.

RESEARCH METHODOLOGY

The present study adopts a descriptive research design to analyze AI-based training needs and skill gap analysis among employees. The study focuses on understanding employee readiness, existing skill levels, and the training requirements needed to adapt to Artificial Intelligence technologies in the workplace. The data for the study is collected using primary data through a structured questionnaire prepared using Google Forms, which allows respondents to conveniently provide their responses online. The sample size for the study consists of 120 respondents, and the sampling technique used is convenience sampling, where respondents are selected based on their availability and willingness to participate in the survey. The collected responses are used to analyze the opinions and perceptions of employees regarding AI-based training needs and skill gaps, and the data obtained from the respondents helps in understanding their readiness to adopt AI technologies in the workplace.

Table 1. DESCRIPTIVE STATISTICS BETWEEN AREAS OF SKILL GAP AND AI IDENTIFIES SKILL GAP BETTER

		Areas of Skill Gap	AI Identifies Skill Gap Better
N	Valid	120	120
	Missing	0	0
Mean		1.380	2.6600
Median		1.000	3.0000
Mode		1.00	3.00
Std.Deviation		.48783	.92354
Variance		.238	.853
Skewness		.502	-.366
Std.Error of Skewness		.241	.241
Minimum		1.00	1.00
Maximum		2.00	4.00

INTERPRETATION

The descriptive statistics show the analysis of the variables Areas of Skill Gap and AI Identifies Skill Gap Better based on 120 valid responses with no missing data. For Areas of Skill Gap, the mean value is 1.38, with a median and mode of 1.00, indicating that most respondents identified similar areas of skill gaps. The standard deviation (0.48783) shows low variation among responses. The values range from 1.00 to 2.00, suggesting limited response categories. For AI Identifies Skill Gap Better, the mean value is 2.66, with a median of 3.00 and mode of 3.00, indicating that respondents generally agree that AI can better identify skill gaps. The standard deviation (0.92354) shows moderate variation in opinions. The responses range from 1.00 to 4.00, indicating a wider spread of responses compared to the first variable. Overall, the results suggest that respondents recognize specific skill gap areas and tend to believe that AI is effective in identifying those skill gaps.

TABLE 2. AI IDENTIFIES SKILL GAP BETTER

Valid		Frequency	Percent	Valid Percent	Cummulative Percent
	Always	17	14	14	14
	Sometimes	48	40	40	54
	Rarely	35	29	29	83
	Never	20	17	17	100
	Total	120	100	100	100

INTERPRETATION

The above table shows the responses regarding whether AI identifies skill gaps better. Out of 120 respondents, 48 respondents (40%) stated that AI sometimes identifies skill gaps better, which represents the highest proportion. Meanwhile, 35 respondents (29%) reported that AI rarely identifies skill gaps better. Additionally, 20 respondents (17%) indicated that AI never identifies skill gaps effectively, while only 17 respondents (14%) stated that AI always identifies skill gaps better. This indicates that most respondents believe AI can identify skill gaps only occasionally rather than consistently, suggesting moderate confidence in the effectiveness of AI in identifying skill gaps.

FIGURE 1. AI IDENTIFIES SKILL GAP BETTER

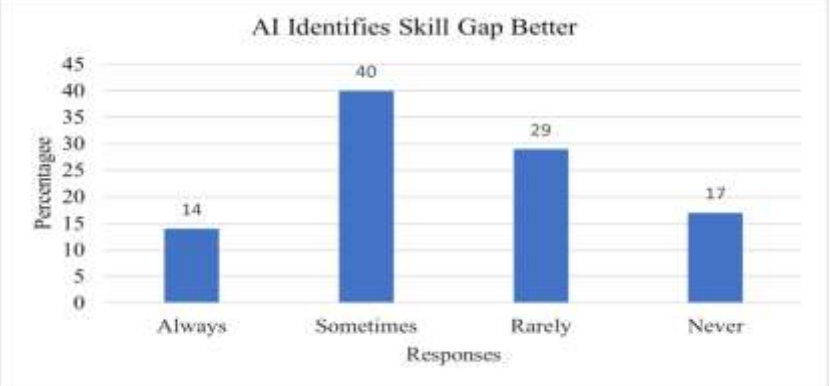

Table 3. CORRELATION BETWEEN THE VARIABLES

		AREAS OF SKILL GAP	AI IDENTIFIES SKILL GAP BETTER
Areas of Skill Gap	Pearson Correlation	1	-.047
	Sig. (2-tailed)		.645
	N	120	120
AI Identifies Skill Gap Better	Pearson Correlation	-.047	1
	Sig. (2-tailed)	.645	
	N	**120**	120

INTERPRETATION

The above table shows the correlation between Areas of Skill Gap and AI Identifies Skill Gap Better among 120 respondents. The Pearson correlation value is -0.047, which indicates a very weak negative relationship between the two variables. The significance value (Sig. 2-tailed) is 0.645, which is greater than the standard significance level of 0.05. This indicates that the relationship between the variables is not statistically significant. Therefore, it can be interpreted that there is no significant relationship between the areas of skill gap and the ability of AI to identify skill gaps better among the 120 respondents.

Table 4. REGRESSION BETWEEN AI IDENTIFIES SKILL GAP BETTER Vs AREAS OF SKILL GAP

Model	Variables Entered	Variables Removed	Method
	AI Identifies Skill Gap Better		Enter
a. Dependemt Variable: Areas of Skill Gap			
b. All Requested Variables Entered			

INTERPRETATION

The regression analysis was conducted to examine the relationship between AI identities skill gap and the areas of skill gap among the respondents. In this model, the areas of skill gap were considered as the dependent variable, while AI identities skill gap better was entered as the independent variable using the enter method. The results show that all the requested variables were successfully included in the model, indicating that the regression analysis considered the relevant factors to determine the relationship between AI identities skill gap and the areas of skill gap among the respondents. This helps in understanding how AI-related skill gaps influence the different areas where respondents experience skill deficiencies.

Table 5. ANALYSIS OF VARIANCE (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.796	1	.796	1.689	.102[b]
	Residual	46.204	98	.471		
	Total	47.000	99			
a. Dependent Variables: Experience Level						
b. Predictors: (Constant), AI Identifies Skill Gap Better						

INTERPTRETATION

The ANOVA analysis was conducted to examine whether AI identities skill gap better has a significant influence on the experience level of the respondents. The results show that the regression model has an F value of 1.689 with a significance value (Sig.) of 0.102. Since the significance value is greater than the standard significance level of 0.05, the relationship between AI identities skill gap better and experience level is not statistically significant. Therefore, it can be concluded that AI identities skill gap better does not significantly influence the experience level of the respondents in this study.

FINDINGS OF THE STUDY

- The descriptive statistics revealed that the mean value for Areas of Skill Gap is 1.38, with low variation among respondents. This shows that most respondents identified similar areas where skill gaps exist.
- The variable AI Identifies Skill Gap Better has a mean value of 2.66, indicating that respondents generally believe that AI can help identify skill gaps, although opinions vary moderately among respondents.
- The frequency analysis shows that 40% of respondents stated that AI sometimes identifies skill gaps better, which represents the highest proportion of responses.
- Around 29% of respondents believe that AI rarely identifies skill gaps effectively, while 17% stated that AI never identifies skill gaps, indicating that some respondents have limited confidence in AI's ability to detect skill gaps.
- Only 14% of respondents believe that AI always identifies skill gaps better, which suggests that full confidence in AI-based skill gap identification is still relatively low.
- The correlation analysis shows a very weak negative relationship (r = -0.047) between areas of skill gap and

AI identifying skill gaps better.

- The significance value of 0.645 indicates that the relationship between the variables is not statistically significant, meaning the variables do not strongly influence each other.
- The regression analysis confirms that AI Identifies Skill Gap Better was entered as the independent variable, while Areas of Skill Gap was considered as the dependent variable, to examine the predictive relationship between the variables.
- The ANOVA results show an F value of 1.689 with a significance value of 0.102, which is greater than the standard significance level of 0.05.
- Since the significance value is greater than 0.05, the regression model is not statistically significant, indicating that AI identifying skill gaps better does not significantly influence the experience level of respondents.
- Overall, the study findings suggest that although respondents recognize the importance of AI in identifying skill gaps, there is only moderate confidence in its effectiveness, and the statistical analysis does not show a strong relationship between the variables considered in the study.

SUGGESTIONS

- Organizations should provide regular AI training programs to improve employees' knowledge and skills in using AI technologies.
- Companies should create awareness about the benefits of AI tools so that employees can better understand and trust AI-based systems.
- Employees should be encouraged to participate in workshops and skill development programs related to Artificial Intelligence.
- Organizations should implement AI-based training platforms that can help identify employee skill gaps more accurately.
- Continuous learning and development opportunities should be provided to help employees adapt to new AI technologies in the workplace.

CONCLUSION

The present study examined the AI-based training needs and skill gap analysis among employees to understand their readiness to adapt to Artificial Intelligence technologies in the workplace. The findings show that employees are aware of certain skill gaps in their work and believe that AI can help identify these gaps to some extent. However, the statistical analysis such as correlation, regression, and ANOVA indicates that there is no significant relationship between the areas of skill gap and the ability of AI to identify skill gaps better. This suggests that although AI technologies have the potential to support organizations in identifying employee skill gaps, their effectiveness depends on proper implementation, employee awareness, and adequate training. Therefore, organizations should focus on providing AI- related training programs, improving employee digital skills, and creating awareness about AI technologies so that employees can better adapt to AI-driven work environments and reduce skill gaps effectively.

REFERENCES

- Bessen, J. (2015). Learning by doing: The real connection between innovation, wages, and wealth. https://doi.org/10.2139/ssrn.2690432
- Brynjolfsson, E., & McAfee, A. (2017). The business of artificial intelligence: What it can—and cannot—do for your organization. Harvard Business Review.
- Davenport, T. H., & Ronanki, R. (2018). Artificial intelligence for the real world. Journal of Business Research. https://doi.org/10.1016/j.jbusres.2017.11.010
- Archana, S., & Gerald, M. (2023). Artificial intelligence in employee training and development: Enhancing organizational performance. International Journal of Management Studies.
- López-Cabrera, M. V., et al. (2024). Artificial intelligence in professional development and talent management: A systematic literature review. Journal of Innovation, Management and Education. https://doi.org/10.1016/j.jjimei.2024.100288
- Ramachandran, R., et al. (2024). AI-based training programs for improving employee skills and workplace efficiency. International Journal of Human Resource Studies.
- Sidhu, P., et al. (2024). Skill gaps in the era of artificial intelligence adoption. Journal of Workforce Development.
- Jagad, P. (2024). Employee readiness for artificial intelligence adoption: The role of digital literacy and training opportunities. European Journal of Engineering Science and Emerging Technology, 6(1). https://doi.org/10.33122/ejeset.v6i1.963
- Savelka, J., et al. (2025). Rapid occupational training programs for AI-driven workplaces. International Journal of Artificial Intelligence in Education.
- Bogart, C., et al. (2025). AI literacy assessment model for evaluating workforce readiness in artificial intelligence environments. Journal of AI and Society.