

# Upskilling the Retail Workforce for Adoption of E-Mobility: The Role of Human Resource Competencies and Artificial Intelligence

Yashwanth Kumar Madagunaki  
School of Management Studies

Vels Institute of Science, Technology and Advanced Studies  
Pallavaram, Chennai, Tamil Nadu, India  
yashwanth.rm@gmail.com

M Kotteeswaran

School of Management Studies  
Vels Institute of Science, Technology and Advanced Studies  
Pallavaram, Chennai, Tamil Nadu, India  
saikottee@gmail.com

**Abstract** - The global shift towards green sustainability has positioned e-mobility at the frontline of industrial transformation, with the retail industry emerging as a substantial area for innovation. Retailers, who are reliant on logistics, supply chain and warehousing are moving towards electric vehicles and other green technologies for reducing their environmental effect. Whereas, this shift is not only technological, but requires a parallel support from the employees. The study, by adapting a qualitative literature review approach, aims to investigate how the competencies possessed by Human Resources by collaborating with Artificial Intelligence technologies, play a crucial role in upskilling the retail workforce to assist and sustain the adoption of e-mobility systems. Further, it also investigates how HR strategies such as training and development, talent planning, employee engagement and performance management are being reimagined to meet the demands of technology driven and low-carbon future. The study has revealed that HR department are responsible for identifying gaps in skills, designing personalized upskilling programs and ensuring that interventions are aligned with the technological upgradations. Despite the various advantages, there are certain challenges. The study uncovered constraints such as lack of digital literacy, budget limitations for training and the need for formulation of clear frameworks supporting green skill development. Hence, the shift to e-mobility particularly in the retail industry will be difficult to achieve without an investment in the Human Resources. This study contributes to the existing literature in this field by mapping the way in which HR competencies play a pivotal role in making the retail workforce to shift smoothly to e-mobility context in which all aspects such as product lines and technologies demand adaptability.

**Keywords** - Artificial Intelligence, E-Mobility, Human Resources, Upskilling.

## I. INTRODUCTION

The global shift towards sustainable practices has accelerated the adoption of E mobility especially within the retail sector as it is aligning itself with the global environmental, social and governance standards. This transition is not only about the replacement of traditional vehicles with electric alternatives but it marks a comprehensive transition of logistics, supply chain, last mile delivery and energy consumption patterns (Bordbar et al, 2021). The major challenge supported by the fact that the retail sector which is highly labor intensive and characterized by high employee turnover often stands behind other sectors in terms of employee upskilling and technology adoption (Gupta et al, 2024). In this perspective

human resource management is no longer a supportive function but a strategic partner for ensuring sustainable transition. Hence, the role of HR evolves from identifying skill gaps and designing required reskilling programs to embrace advanced technologies such as AI to personalize learning journeys, drive performance outcomes and forecast talent needs. As E-mobility infrastructure and ecosystems upgrade the retail organizations are compelled to align their strategies with these environmental and technological shifts (Davenport & Ronanki, 2018). The deployment of AI tools in human resource functions from predictive analysis for workforce planning to AI driven personalized learning platforms and VR powered training practices offers various opportunities to customize the development of employees (Jarrahi et al, 2023). Artificial intelligence tools can analyze performance data, recommend career pathways, personalized training content ensuring that workers across the supply chain process from the warehouse employees and logistics coordinators to the store management and customer service executives are prepared enough to operate in an environment functioning with E-mobility (Kambur & Akar, 2022). Simultaneously, the backend employees should be capable of interpreting the insights generated by artificial intelligence tools related to route optimization, maintenance forecasts and carbon emissions. So, AI acts as both enabler and amplifier of HR's strategic goals thereby ensuring that the workforce readiness is anticipatory in nature not alone reactive.

Further, the integration of AI with human resource does not only improve the operational efficiency but also foster a culture of continuous learning and innovation (Madhumithaa et al, 2025). As the organizations incorporate e-mobility into their core values employees must perceive sustainability and technological literacy as a part of their professional identity (Maghsoudi et al, 2024). Human Resource Departments with the help of AI enabled platforms can track engagement levels, behavioral shifts and learning outcomes making the learning measurable and impactful. Most importantly, Malik, Silva & Budhwar (2022) identified that AI also assists in meeting inclusivity in upskilling initiatives through learning gaps identification and individualized delivery modes for various learning skills and styles.

This involves the incorporation of electronic HRM practices that leverage AI tools to automate talent management enable line managers and employees to take ownership of their skill upgrade and automate training

pathways (Stephany & Teutloff, 2022). Thus, the ultimate objective is to liberate the HR professionals from routine tasks and shift their focus to strategic issues such as planning the workforce needs with respect to future sustainability goals or personalizing learning strategies in accordance with the abilities and competence of the workers (Semeraro, Griffiths & Cangelosi, 2021). Artificial intelligence tools can transform HR data into predictive information for forecasting activities prior to their necessity. Meanwhile, Subbarao (2024) claimed that, AI driven learning platforms can also provide customized learning paths with modules based on the employees' progress and interests. So, when the theme is employee focused the employees who are struggling with foundational knowledge can be given special attention and care while more technologically capable transition into advanced modules of energy efficiency or EV diagnostics (Westover, 2024). In addition to such adaptive materials, immersive technologies like virtual reality and augmented reality can transform the training process for E-mobility positions (Wang, Zhang & Yu, 2022). These techniques are able to recreate real world problems such as breakdown or troubleshooting as the employees can have a hands-on experience in a simulated world. Adding on to this, AI coaching tools that are the virtual mentors also provide immediate feedback and support enabling employees to refine their skills (Robert et al, 2020).

This article sets out to explore how Human Resources and AI are complementing the upskilling of the retail workforce in regard to the global transition towards e-mobility. As the retail sector is increasingly shifting to electric vehicle, it's visible that the HRs must undertake a proactive and a strategic role not only a supportive role.

## II. CONCEPTUAL MODEL

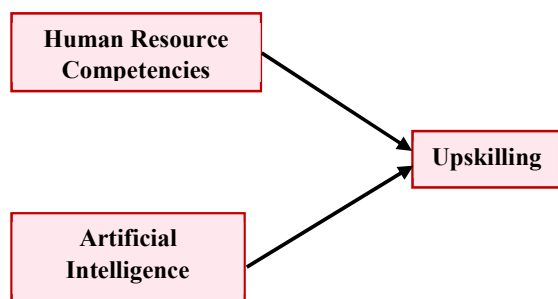


FIGURE 1: CONCEPTUAL FRAMEWORK  
Source: Author

## III. LITERATURE REVIEW

### A. Upskilling for E-Mobility

The rapid shift from conventional vehicles to electric vehicles is shift is demanding a comprehensive redirection of employee competencies. While the traditional retail tasks have centered on inventory management, customer service and brand representation, e-mobility introduces double capability paradigm which are technical proficiency in EV technology and retail excellence in sales, operational

support and customer education (Yan et al, 2023). Technical skills encompass from understanding of electric vehicle mechanics such as charging protocols, battery systems and high voltage safety to digital literacy in using analytics tools and managing charging infrastructure (Kumar, Sharma & Mittal, 2024). Many reports indicate that over 60-70% of retail companies are globally are investing hugely in training their existing workforce for EV and infrastructure roles (Ramachandran et al, 2024). Research highlights that experiential and hands-on learning is integral to effective upskilling in e-mobility. Traditional learning systems are insufficient for such complex technical knowledge (Nelson, Biddle & Shapira, 2023). Instead, immersive programs, virtual or physical enable employees to work with real hardware, simulate customer interactions, perform live diagnostics involving EV features and charging sessions (Westover, 2024). At the same time, augmented integration of reality in corporate training has proven effective in technical training.

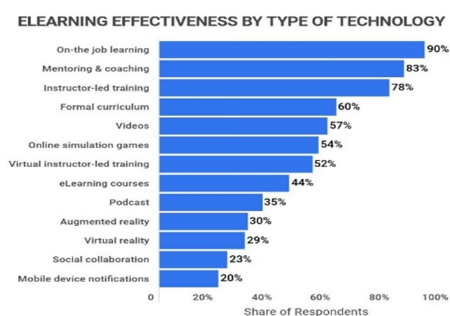


FIGURE 2: SELF LEARNING UPSKILLING FOR TYPE OF TECHNOLOGY

Source: <https://www.zippia.com/>

Hence, investing in upskilling related to e-mobility delivers strategic returns across various dimensions such as workforce resilience, sales growth and brand differentiation (Bangroo, 2023). Retailers that equip employees with e-mobility knowledge can address customer concerns around range, performance and charging – leading the higher satisfaction and higher conversion rates (Ma, Jorgensen & Ma, 2024). Studies emphasize that retail firms investing in digital and sustainability training experience up to 30% increased productivity, with 14% low turnover.

### B. Role of HR in Upskilling for E-Mobility

Such alignment guarantees the training activities are goal-oriented and structured so that proactive, as opposed to reactive, talent needs appropriate for e-mobility requirements are facilitated. HR's planning function also engages in external collaborations with industries, vocational schools and government upskilling initiatives to construct systematic training programs (Mubarok & Kartini, 2023). Within the corporation, HR also creates rotational programs, career transition tracks and stretch assignments to enable new job roles and facilitate competency acquisition (Schnermann, 2022). Thus, HR is the designer of workforce transformation with a deliberate mapping of skills, roles and training modules to future mobility needs. With unambiguous strategic intent, HR becomes the architect and

facilitator of learning systems which enhance e-mobility skills throughout the firm.

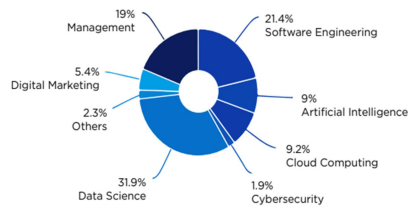


FIGURE 3: UPSKILLING TRENDS HR NEEDS TO FOCUS

Source: <https://www.mygreatlearning.com/>

Recent literature emphasizes combined methods like VR/AR simulations, mobile modules and conventional hands-on training. Such methods are appropriate for busy retail settings, allowing employees to acquire technical knowledge (Teko & Lah, 2022; Madhumithaa et al, 2025). HR creates digital platforms that enable the HR to set up customized learning experiences, drive quantifiable impact and engage with gamification, creating a cycle of repeated upskilling (Rahman, 2025). Through the leveraging of advanced analytics, combined performance tracking and motivational design, HR professionals are able to ensure that workforce development is data-informed, strategic and business-linked, creating retention, growth and future-readiness

### C. Role of AI in Upskilling for E-Mobility

Artificial Intelligence is transforming the workforce development by expanding learning experience and individualizing e-mobility learning. AI-facilitated platforms evaluate learners' personal preferences, skill level and job function for curating tailored learning paths from battery testing to EV charging operations and customer counsel on range anxiety (Kumar, Sharma & Mittal, 2024). These platforms continuously review learner performance and aggressively adapt content pacing, difficulty and modality for aligning continuous progress. Modal et al (2025) claim that, personalization enhances interaction, effectiveness and retention of learning by guaranteeing that each of the learner receives accurate content they need, at the right moment thus monitoring expertise in both customer facing and technical skills necessary for e-mobility retail environments. AI is also transforming decision-making through rigorous testing of competence and forecasting analytics, necessary to formulate e-mobility upskilling programs (Kothinti, 2025).

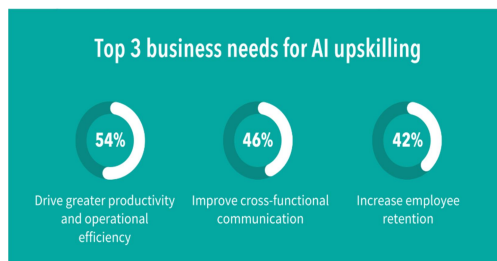


FIGURE 4: AI IN UPSKILLING

Source: <https://www.correlation-one.com/>

Through analysis of performance metrics, organizational requirements and job patterns, AI detects current and future

skill gaps like EV fleet data analytics, charger installation or customer EV approval guidance (Yan et al, 2023). Predictive modeling and people analytics allow HR teams to predict skill shortages ahead of time before they impact operations, allowing forward-thinking upskilling interventions to be developed to suit frontline as well as back-office occupations (Bangroo, 2023).

Huang (2021) claims that Artificial Intelligence solutions improve evaluation, participation and accountability in e-mobility upskilling initiatives through performance-based analytics and interactive simulations. Virtual and augmented reality methods fueled by Artificial Intelligence develop realistic scenarios like EV charging station fault location, high-voltage equipment checks or customer consultation which enable the learners to practice securely and continuously prior to implementing them in real situations (Bucher et al, 2024). Gamification elements like points, badges and chatbot guides encourage drive and competition that results in the deeper memory of knowledge. As an integral part, AI powered platforms connect learning activities to ROI and performance metrics (Savelka et al, 2025). By relating training performance with measurable results like reduced service time, customer satisfaction or EV sales rates, AI enables HR to authenticate the effect of upskilling investments (Ganuthula & Balaraman (2025). Adding on, timely feedbacks generated by AI enables learners to emphasize weak areas or improve faster in stronger ones, thereby ensuring continuous improvement (Bohra & Neeta, 2025).

### Objectives of the Study

- To examine the role of HR competencies in leveraging AI tools in personalizing upskilling pathways.
- To investigate the relationship between HR competencies and Artificial Intelligence on Upskilling of retail employees.
- To investigate the effect of HR competencies and Artificial Intelligence on Upskilling of retail employees.

## IV. METHODOLOGY

### A. Research Approach

The study undertook a quantitative research approach, which is empirical in nature. It focused on apprehending the role of Human Resource competencies and Artificial Intelligence tools on Upskilling of the employees in the retail sector. Human Resource Competencies and Artificial Intelligence are the independent variables and Upskilling is the dependent variable.

### B. Population

The population of the study constituted of the Human Resource Professionals working in retail companies at Bengaluru. The professionals belonged to the age group of 21 – 50 years. The study has been conducted in the retail sector due to its unique characteristics and high usage of vehicles for its last-mile delivery and distribution.

### C. Sample

The sample for the study has been derived using convenience sampling method which comes under the type

non-probability sampling method. All the sampling units for the sample have been taken from Bengaluru region. 250 questionnaires were physically distributed to the professionals working in retail companies such as Flipkart, Titan, Nilgiris, Kurl-on, Lifestyle, Ajio, Decathlon, Max and so on. 224 questionnaires were found to be valid and were considered for further evaluation of the study.

#### D. Measurement scale

TABLE 1: MEASUREMENT SCALE OF THE VARIABLES

Variables	Author name & Year
Dependent Variable: Upskilling	Ismail et al (2024)
Independent Variable: Artificial Intelligence	Kambur & Akar, (2022)
Independent Variable: HR Competencies	Bordbar et al (2021)

The below table displays the factor values and Cronbach Alpha Values of the statements adopted from the authors.

TABLE 2: FACTOR VALUES AND CRONBACH'S ALPHA VALUES

Variable	Items	Factor Scores	Cronbach's Alpha Values
Upskilling	I usually update my knowledge when my job role changes	.840	.911
	I upskill myself when technological advancements alter my tasks	.850	.912
	My organization encourages employees for continuous upgradation	.868	.909
	I feel confident on my job after upskilling myself	.863	.912
	Upskilling opportunities improves the commitment to my organization	.774	.912
Artificial Intelligence	AI tools help the HRs to focus on strategic tasks	.855	.913
	Using AI helps to deliver bias free evaluations	.809	.915
	AI - driven systems improve efficiency	.719	.916
	Usage of AI has increased fairness and transparency in HR decisions like compensation and promotion	.866	.924
HR Competencies	I am able to align HR initiatives with the business strategy	.803	.914
	I am able to design HR policies with the available data	.860	.914
	I provide timely and constructive feedback	.760	.913
	I am capable of building trust through open communication and integrity	.809	.915
	I am influence to business leaders on HR issues effectively	.808	.916

### V. DATA ANALYSIS AND INTERPRETATION

The data required for the study has been collected through structured questionnaires which were distributed to HR professionals in the Retail Sector located at Bengaluru. The collected data was coded and then analyzed using Statistical Package for Social Sciences (SPSS). For validating the reliability of each variable, the Cronbach Alpha test was employed. And for testing the hypothesis proposed in the study, correlation analysis was performed to assess the stability and the influence of relationship between the variables of the study.

#### A. Hypothesis

H1: There is a positive relationship between Human Resource Competencies and Artificial Intelligence and Upskilling

H2: There exists a direct positive effect of Human Resource Competencies and Artificial Intelligence on Upskilling

#### B. Descriptive Statistics

Descriptive statistics presents the summary of the Demographic characteristics of the entire dataset. It aids researchers in comprehending the essential characteristics of the data without drawing conclusions that go beyond the scope of the study sample. Frequency distributions were generated for each of the demographic variables in the study.

TABLE 3: DESCRIPTIVE STATISTICS

Demographic details	Options	Frequency	Percentage
Gender	Male	130	57.8
	Female	94	42.2
Age group	21 to 30 years	85	38.1
	31 to 40 years	86	38.2
	41 to 50 years	42	18.7
	50 year and above	11	4.9
Educational Qualification	Diploma	10	4.4
	UG	114	51.1
	PG	91	40.4
	Above PG	9	4
Work Experience	Below 2 years	29	12.9
	3 - 4 years	40	17.8
	5 - 6 years	33	14.7
	7 - 8 years	29	12.9
Work Level	9 years and above	93	41.8
	Junior Management	63	28
	Middle Management	130	58.2
	Senior Management	31	13.8
<b>Total</b>		<b>224</b>	<b>100</b>

The above table 5.1.1 displays the Demographic details of the respondents. The gender of the respondents indicates that 42.2 % of the respondents were female and 57.8 % percentage of the respondents were male, most of the respondents nearly 38 % of them were equally distributed among the age group of 21-30 years and 31-40 years. The banks appear to have hired more people with bachelor's degrees according to the collected data. When the work experience is examined, it has been observed that majority of the respondents is working for 9 years and above in each bank. Further, according to the results, most of the respondents belong to middle level category.

#### C. Correlation Analysis

Hypothesis: There is a positive relationship between Human Resource Competencies and Artificial Intelligence and Upskilling

TABLE 4: CORRELATION ANALYSIS

	Upskilling	Artificial Intelligence	HR Competencies
Upskilling	1	.646**	.665**
Artificial Intelligence		1	.555**
HR Competencies			1
**. Correlation is significant at the 0.01 level (2-tailed).			

The above table displays the Pearson’s Correlation analysis of the relationship between the study variables namely Upskilling, Artificial Intelligence and HR competencies. The results imply that the correlation between Upskilling and Artificial Intelligence is strongly positive with a coefficient value of 0.646. This states that Artificial Intelligence tools promote opportunities for smarter upskilling making them measurable, personalized and efficient. The correlation coefficient value between Upskilling and HR competencies are 0.665., which indicates a positive correlation between the both. This denotes that upskilling initiatives directly enhance HR capabilities across strategic, technical and interpersonal aspects translating into efficient talent management, tangible business impact and more confident decision making. Finally, the relationship between Artificial Intelligence and HR Competencies is denoted by coefficient value of 0.555, which shows that there is a moderate correlation between the two variables. This implies that AI tools do not only augment HR competencies, but also enhances human centric abilities such as creativity, innovation, learning and development. Hence it leads to the acceptance of the Hypothesis: There is a positive relationship between Human Resource Competencies and Artificial Intelligence and Upskilling

D. Regression Analysis

Hypothesis: There exists a direct positive effect of Human Resource Competencies and Artificial Intelligence on Upskilling

TABLE 5: REGRESSION – MODEL SUMMARY

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.629 <sup>a</sup>	.395	.393	.49971
2	.716 <sup>b</sup>	.513	.508	.44960
a. Predictors: (Constant), Upskilling				
b. Predictors: (Constant), Upskilling, HR Competencies				

The above table presents the model summary of the Regression analysis. This denotes that with only upskilling; the R value is 0.629 and R square value is 0.395. When the other variable – HR competencies is brought in, the R value increases to 0.716 and R square value increases to 0.513. This small increase in the R Square value suggests that the HR competencies improve the descriptive power of the model avoiding overfit.

VI. FINDINGS AND DELIBERATIONS

The findings of the study imply that AI powered platforms are substantially elevating training through personalization with the help of real time data – with measurable outcomes across capability development and onboarding. AI systems initially assess the employee’s current skill level, individual preferences and performance analytics. Based on such insights, it designs customized training methodology that adapt in real-time tailoring content format, difficulty and progression pace to maximize learning effectiveness. Unlike one-model-fits all manual, such adaptive journeys direct employees to find the most pertinent content, like customer engagement, safety protocol or technical diagnostics. By providing the right module at the right time, in everyday workflows, AI enables staff to learn what they require precisely, when they need it, eventually improving engagement and retention. Further, AI tools regularly track performance and learning metrics to anticipate skill deficits, especially significant in the fast-changing e-mobility contexts, where predictive analytics point areas where additional learning is essential – before the issue arises. Moreover, intellectual dashboards corroborate learning progress with measurable results such as reduction in service errors or EV sales thereby enabling HR to optimize learning budgets, demonstrate ROI and make data-driven modifications. This outcome aligns with the findings of the research made by Modal et al (2025) and Westover (2024).

Likewise, the study made evident that, the HR department act as the initiators of upskilling in the retail e-mobility aspect by cautiously designing role-specific learning frameworks, conducting competency mapping and forming strategic partnerships with OEMs, governments and training academies. Competency mapping helps the HR to define the need of technical, digital and customer skills essential for new EV roles, whereas diagnostic techniques highlight the proficiency of the current workforce and identify precise skill gaps. This makes the HR capable to create learning frameworks adjusted to various roles with clear progress stages and proficiency indicators, ensuring training is relevant and consistent. Hence, HR is able to continuously improve training methods based on real-time utilization, performance outcomes and competency attainment, ultimately ensuring that the upskilling initiatives remain cost-effective, outcome aligned and future-ready. This finding was consistent with the study made by Kumar (2023) which stated that seamless integration of AI and HRM ensures upskilling programs align with the business goals, enabling ROI tracking, real-time analytics and regular refinement of development initiatives.

With evidence from empirical data, the findings of correlation and regression analysis infer that, AI tools do more than only augmenting HR functions – they also elevate human-centric competencies such as innovation, creativity and continuous learning. Empirical outcomes support the hypothesis that HR competencies with Artificial Intelligence and Upskilling create maximum outcomes.

## VII. CONCLUSION

Integration of AI empowers the HR to scale learning methods effectively, enabling accuracy in content delivery, performance related training matrices and predictive forecasting of skill demands. Adaptive learning platforms, feedback systems and virtual labs modify access to development across various roles at the same time maintaining transparency and compliance to ethical standards. By linking these tools with strategic overlook, HR not alone promotes EV sales performance, safety results and customer trust, but also demonstrates quantifiable ROI, solidifying executive acquirement for constant investment. Ultimately, the synergy of HR competencies and AI techniques transitions e-mobility upskilling programs from a one-off enterprise into a culture of continuous learning and innovation. This future ready method not only forwards compatible workforce abilities but at the same time builds employee engagement and organizational resilience. As retail industries evolve over time, HR needs to upgrade themselves as both a steward and architect, by guiding employees through digital interruption, reiterating ethical use of AI, incorporating a workforce that is both human-centric and tech-savvy, composed to lead in the era of e-mobility. Hence, this study contributes to the existing literature in this field by mapping the way in which HR competencies play a pivotal role in making the retail workforce to shift smoothly to e-mobility context in which all aspects such as product lines and technologies demand adaptability.

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