EVALUATING THE ROLE OF UPSKILLING AND RESKILLING PROGRAMS IN REDUCING THE DIGITAL SKILL GAP IN INDIAN IT COMPANIES

Shivani Raina

Research Scholar, Rajasthan Technical University, Kota Rajasthan

Payal Sharma Upadhyay

Principal, Poddar Management and Technical Campus, Jaipur

ABSTRACT

With the rapid development of digital technologies, the minimum skill levels required within the information technology (IT) sector have changed, and this has increased concerns regarding the digital skill gap for employees of IT companies based in India. Consequently, companies have started implementing upskilling and reskilling programmes in order to improve the adaptability of their employees and to gain/maintain a competitive edge in the market. This study aimed to assess the impact of upskilling and reskilling programmes in closing the digital skill gap within the IT sector in India. A research design was quantitative and descriptive-correlational in nature, and the data collection technique involved the administration of a sufficiently structured questionnaire to IT professionals employed in the mid and large tier IT companies in India. Statistical analysis was done using descriptive statistics and correlation statistics. The outcomes of the study revealed that there were positive relationships that were statistically significant between digital skill competency and the level of participation in both upskilling and reskilling programmes, and, also, between digital skill gap and the level of participation in both upskilling and reskilling programmes. Furthermore, there was a very high correlation between the competency of digital skill and the perceived reduction of digital skill gap, which indicated that proficiency in digital skills coupled with the confidence and preparedness to adapt to any rapid change in technology. Additionally, the statistical relationship findings also showed that, regardless of their educational level and professional experience, participants of upskilling and reskilling programmes perceived having these attributes sufficiently, which confirms the structured learning continuum. The study has found that programmes for upskilling and reskilling are especially effective in bridging the digital skills gap in Indian IT businesses. The results highlight the need for integrating strategies for continual learning into organisational and systemic skill development to prepare workers for the digital economy.

Keywords: Digital Technology, Informational Technology, Upskilling, Skill Development.

INTRODUCTION

Rapid technological advancements have profoundly altered global employment trends, with digital skills becoming essential for both organisational success and individual employability. The Indian Information Technology (IT) sector is deemed to be the backbone of the country's knowledge economy, contributing almost 8% of the country's GDP and employing more than 4.5 million people (NASSCOM, 2024). However, with advancements in artificial intelligence (AI), machine learning (ML), data analytics, and cloud computing, the industry now faces a digital skill gap (Nizami, Tripathi, & Mohan, 2022; Jagannathan, 2021). Almost half of the world's current workforce is estimated by the RAND Corporation to need a skills reset within the next 5 years to be able to retain employability (Feijao, Flanagan, van Stolk, & Gunashekar, 2021). In the context of India, this challenge is even more critical due to a rapidly expanding digital transformation ecosystem and uneven digital education accessibility

(Chakrabarti, 2022; Khan, Sethi, Mustafa, & Bibi, 2025). The digital skill gap represents a disparity between the skill sets required by the organisation and the digital skills that the employees currently possess and can put to work. While the Indian IT sector has been quick to embrace new and developing technologies, the same cannot be said of the sector's workforce (Garg, Singh, and Tabassum, 2025; Lakshmi, Durgude, and Chitra, 2024). This skill gap diminishes productivity and innovation and endangers India's position in the global outsourcing and software services industry. As a result, there has been a noticeable increase in organisational focus on upskilling and reskilling activities designed to remediate employees' digitally related skill deficits. Upskilling and reskilling are, respectively, the narrowing and closing of a skill gap (Pandey and Vishwakarma, 2024). While these programmes are emerging as a priority, they are still viewed by many as noncore activities for the Human Resources function (Chakraborty, Konwar, & Chakrabarty, 2025).

Governmental and business sector collaborations have attempted to tackle the challenge on an extensive scale. With the aim of improving digital skills and fostering lifelong learning in various domains, Skill India Mission, Digital India, and NASSCOM's FutureSkills Prime Initiatives have been launched (NASSCOM, 2024). Since 2019, these initiatives have trained more than 1.2 million IT professionals, which has propelled India's Digital Readiness Index by almost 27% (Nizami et al., 2022). Nonetheless, some academics emphasise that in spite of these initiatives being available on a national scale, most corporate upskilling initiatives are still disjointed and lack a comprehensive, systematic, and evaluative approach that would contribute to the achievement of a specific organisational goal (Bhaaskaran, 2024; Ohlan, 2023). Moreover, as highlighted by Patre, Chakraborty, and Kar (2023), even though accessibility to online examples of EdTech such as Coursera and digital skills training platforms like FutureSkills Prime has been broadened, their effectiveness is still limited by an organisation's culture, the support of its management, and the motivation of its learners.

From a strategic human resource development (HRD) standpoint, organisations building continuous learning ecosystems are crucial for resilience (Garg et al. 2025; Chakrabarti, 2022). Jaiswal, Arun, and Varma (2023) state that embedding upskilling and reskilling into the core business strategy not only closes skill gaps but also boosts employee engagement and the ability to innovate. In the same vein, Feijao et al. (2021) stress the greater productivity and innovation growth for both countries and companies that treat reskilling as an investment rather than an expense. However, limited budget allocation, dispersed digital networks, and resistance to change continue to hinder these initiatives in India (Parmar and Yankson, 2025; Nalhe and Arts, 2025). Considering these factors, the current study is of utmost importance and relevance as it aims to evaluate the success of upskilling and reskilling programmes in the context of Indian IT companies. This study seeks to investigate the impact of these programmes on employee digital competencies, workforce flexibility, and organisational adaptability to technological change. This study seeks to advance both theory and practice in the human capital and digital transformation nexus (Chakrabarti, 2022; Jagannathan, 2021) by focusing on India's IT sector, a global digital economy leader, yet one that is plagued by a skills gap.

LITERATURE REVIEW

India is home to one of the world's largest information technologies (IT) industries and is experiencing an expanding digital skills gap as a direct result of the Fourth Industrial Revolution. This gap is forcing companies to implement structured upskilling and reskilling to ensure their employees remain competitive and employable (Nizami, Tripathi, & Mohan, 2022; Jagannathan, 2021). As new technologies, such as artificial intelligence (AI), cloud

computing, blockchain, and data analytics, continue to transform job requirements, researchers warn that the traditional education system will fail to meet the changing needs of the workforce. This will result in a failure to address the essential and urgent need for the workforce to continually learn professionally (Chakrabarti, 2022; Khan, Sethi, Mustafa, & Bibi, 2025). There is a recognition that upskilling, which is the building of existing digital competencies, and reskilling, which is the transition to new job roles, are both critical in the strategic management of an organization's human resources (Pandey & Vishwakarma, 2024; Garg, Singh, & Tabassum, 2025). According to The RAND Corporation, sustained reskilling coupled with digital learning, which is endemic to an organization, is the most effective way to counter workplace loss due to technology and is therefore, most effective in the midst of a recession. In the Indian context, hybrid reskilling programmes that integrate AI with adaptive learning have proven, empirically, to improve staff retention and the proficiency of employees (Lakshmi, Durgude, & Chitra, 2024). Chakraborty, Konwar, and Chakrabarty (2025) reiterate that companies integrating reskilling into performance assessments report markedly improved scores in innovation and productivity. There is empirical evidence supporting the strong correlation between organised digital training and adaptability; Chakrabarti (2022) reported a digital training and adaptability correlation of $r = .64$ ($p < .01$), whereas Kallidukkil and Jayaraj (2024) showed that ongoing training enhanced employee performance and decreased perceived skill obsolescence.

Nizami et al. (2022) and Feijao et al. (2021) observe that India has about 4.5 million IT professionals. By 2025, it is predicted that more than 50% of India's IT professionals will need reskilling. This correlates with the emergence of the Skill India Mission, Digital India, and the NASSCOM FutureSkills Prime, which have cumulatively reskilled over 1.2 million professionals by 2023. While researchers identify an absence of boundary issues, particularly in Tier-II cities, with the alignment of curricula, the absence of corporate ministers, and the unequal distribution of digital commodities (Bhaaskaran, 2024; Ohlan, 2023). Khan et al. (2025) argue that the digital inclusion policy should focus more on affordable insuring reskilling, while Nalhe and Arts (2025) emphasise that linking policy initiatives with learning ecosystems at the firm level is critical for sustainable digital transformation. In the digital space, large organisations like Infosys (Lex), TCS (Elevate), and Wipro (DigiNxt) have embedded frameworks for lifelong learning to manage technological disruptions (Patel, 2023; Garg et al., 2025). Lakshmi et al. (2024) argue that the speed of digital mastery is enhanced by the use of gamified learning combined with micro-credentials, while Patre, Chakraborty, and Kar (2023) state that EdTech platforms like Coursera and FutureSkills Prime are accessible and scalable solutions to acquiring digital skills. In contrast, there is only a 40% post-training evaluation of the outcomes by mid-tier IT companies, according to Pandey and Vishwakarma (2024), which leans on the outcomes of training ROI to be more of evaluative in nature.

Behavioural aspects related to reskilling also matter. Chakraborty et al. (2025) mention that the belief that an organisation supports employees to learn relates to the organisation's innovative behaviour; similarly, Garg et al. (2025) say that learning-oriented leadership improves employee engagement and retention. In contrast, Parmar and Yankson (2025) mention opaque budgets, managerial complacency, and employees' reluctance to adopt new tools and technology. Bhaaskaran (2024) informs that many organisations in India still do not have a Digital Competency Framework to measure the impact of training. Digital equity, as a shortage, is also reported by Ohlan (2023) as a significant problem in executing large-scale reskilling initiatives, particularly in India. In the IEEE Transactions on Learning Technologies, Patre et al. (2023) quantitatively confirm that in the case of IT professionals,

high-frequency learning using EdTech increased digital confidence by 25%, while noting that self-regulation and managerial support are key success factors. Likewise, on a global scale, Feijao et al. (2021) and Bommanavar (2023) also support the assertion that countries that have invested in the development of a lifelong learning ecosystem have experienced greater economic resilience to the adverse effects of workforce automation. In India, Jagannathan (2021) and Chakrabarti (2022) argue that reskilling goes beyond enhancing digital skills, and fosters social equity by providing broader access to prospective employment opportunities.

Reskilling models will need to integrate more personalised AI learning solutions as they appear to have a more significant impact on skill acquisition. For example, Jaiswal, Arun, and Varma (2023) report for Taylor & Francis that personalisation through AI learning can reduce skill acquisition by 30%. Lakshmi et al. (2024) report that hybrid learning ecosystems (which integrate teaching with AI, coaching, and micro-credentialing) significantly improve the learning and application of digital competencies. For Chakraborty et al. (2025), learning ecosystems involve the continuous adjustment of learning activities through learning analytics driven by employee learning and performance. NASSCOM (2024) anticipates that by 2030, 80% of IT employees will need to be reskilled every 18 to 24 months. Thus, structurally, organisations must default to building a culture of lifelong learning as opposed to an HR programme. This concurs with Feijao et al. (2021), who recommend that national skills framework, AI, and analytics be coupled to predict skill shortages. On the other hand, Pandey and Vishwakarma (2024) and Nalhe and Arts (2025) do argue for the need of institutional leadership, an investment of the right resources, and the achievement of targeted learning outcomes.

The review of literature broadly indicates that upskilling and reskilling initiatives are essential for addressing India's digital skills gap within its IT industry. Numerous quantitative studies suggest that structured digital skills training improves employee mobility and innovation at the organisational and national levels (Garg et al., 2025; Chakrabarti, 2022; Lakshmi et al., 2024). However, funding issues, unequal digital access, and underdeveloped evaluation frameworks still persist (Bhaaskaran, 2024; Ohlan, 2023). Consequently, future studies should be longitudinal and evidence-based to capture the return on learning over the long term, as well as the extent to which AI-based adaptive systems can promote institutionalised continuous transformation of the workforce. It can be concluded that reskilling in India's IT sector is no longer merely a responsive activity, but a strategic necessity that combines technology, policy, pedagogy, and the empowerment of digital skills to keep the nation competitive in the global knowledge economy (Jagannathan, 2021; Feijao et al., 2021; Nizami et al., 2022).

Objectives
This study was conducted:

- To analyse initiatives related to upskilling and reskilling in Indian IT organisations.

- To examine the impact of upskilling and reskilling initiatives on closing the digital competency gaps of employees.

- To explore the challenges that such initiatives face.

- To provide recommendations for the establishment of digital sustainable learning ecosystems in the Indian IT industry.

Methodology

This study utilised a quantitative, descriptive-correlational approach, which is used to assess the extent to which upskilling and reskilling initiatives help mitigate the digital skills gap among employees of IT companies in India. This approach helped to empirically assess the relationships between the measurable variables of training programme participation, digital skills, and self-assessed skills improvement. Given the case scenario, a quantitative approach was the best option because it provided a means to obtain unbiased results concerning the variables and the patterns of the relationships between the variables using statistical methods (Creswell & Creswell, 2018). The study employed a cross-sectional design, meaning that data were gathered at a given point in time. This methodology provided a means to determine the existing state of digital skills development efforts within the Indian IT industry. This provided the ability to determine the relationship between the level of exposure to upskilling and the perceptions of digital capability, which is consistent with the factors that characterise non-experimental research within the social sciences.

Study participants were employees of medium-sized and large IT companies throughout the country, including IT consulting, business process outsourcing (BPO), and software development companies. The study participants were affected the most by the digital transformation process, and were the principal targets for upskilling and reskilling programmes. To achieve representation across sub-sectors, and various levels of professional experience, the researchers utilised a stratified random sampling approach. Employee strata were defined by their organisational level and type of role (junior, middle, and senior management), as well as the organisational level of the IT company (junior, middle, and senior management). The optimal sample size was determined to be 300. The authors distributed 350 electronic surveys within professional groups on LinkedIn and among the HR staff of several IT companies. The study achieved 312 completed questionnaires.

Data were collected using a structured self-administered questionnaire developed specifically for this research. The survey instrument was constructed and tailored for the research purpose using available validated frameworks. The questionnaire was structured to ask four sections. The first section gathered demographic data, including age, gender, educational attainment, designation, and years of service. The second section was aimed at exposure to upskilling and reskilling, including frequency, duration, and usefulness. The third section focused on digital skills self-assessment, which captured the employee self-assessment proficiency of skills like data analytics, coding, and digital communication. The fourth section focused on the perceived effect of the training received on the enhancement of skills and the flexibility to the adaptable. Each of the main constituting elements used a five-point Likert scale ranging from 1 = Strongly Disagree to 5 = Strongly Agree (Pandey & Vishwakarma, 2024; Garg, Singh, & Tabassum, 2025).

This study investigated the variables that were considered to be both independent and dependent. The extent of participation in an organised digital training programme was described as the independent variable. The two dependent variables were digital skills competence and perception of skill gap reduction, which were measured on an interval scale. In order to examine possible channels of influence, the control variables of years of experience and educational level were integrated. These operational definitions resonated with other research on digital workforce readiness (Chakrabarti, 2022; Patre, Chakraborty, & Kar, 2023).

Data was analysed using IBM SPSS Statistics. Descriptive statistics such as mean, standard deviation, and frequency distributions were calculated to describe and summarise the

National Research Journal of Sales & Marketing Management

Volume No: 12, Issue No: 2, Year: 2025 (July-December)

PP: 115-126

ISSN: 2349-512X

Peer Reviewed & Refereed Journal (IF: 6.95)

Journal Website www.nrjsmm.in

demographic profile and the response patterns. Reliability analysis was conducted to confirm the internal consistency among the variables, and the Shapiro-Wilk and Kolmogorov-Smirnov tests were used to assess the normality of the variables. Pearson's correlation coefficient (r) was the primary inferential statistical method used to describe and assess the participation in upskilling/reskilling programmes and the level of digital skills competency. The significance level was set at $p < 0.05$. Also, partial correlation analysis was conducted to exclude the influence of education and experience on the relationship between training and digital skills. The results were compared to previous literature and interpreted to answer the objectives of the study. The nature of the study's cross-sectional design and the use of self-report data presented some limitations. Since the data were collected at a single point in time, no assumptions could be made about the effect relationship between upskilling initiatives and the development of the skill gap. Furthermore, self-report assessments may have introduced a degree of bias, as respondents may have either over- or underestimated their digital skills. The sample was restricted to Indian IT professionals, which may limit the applicability of the findings to other sectors or countries. Future research can consider the use of longitudinal and mixed methods approaches to gain insight into behavioural changes and learning retention over a sustained period.

Analysis

The analyses have particular constructs consisting of demographics, the reliability and internal consistencies of the scales, and the correlation and strength of the relationships among the variables. The analyses were done using SPSS. The confidence interval was set at 95% (p <. 05).

OVERVIEW OF RESPONDENTS

The analyses were conducted on 312 responses. Table 1 shows that the data set, in terms of gender, was comprised of 62.8% of the respondents being male and 37.2% being female. In terms of the respondents' ages, 44.9% of respondents were in the ages 26 - 35 cohort, and 33.7% were in the ages 36 - 45 cohort. In terms of experience, 39.1% of respondents were in the 6 - 10 years of experience cohort, and 28.8% of respondents had experience more than that. In terms of education, 58.3% of the respondents had postgraduate education in computer science, information systems, or business administration.

Table 1: Demographic Profile of Respondents (n = 312)

Demographic Variable	Category	Frequency	Percentage (%)
Gender	Male	196	62.8
	Female	116	37.2
Age Group	20–25 years	48	15.4
	26–35 years	140	44.9
	36–45 years	105	33.7
	Above 45 years	19	6.0
Experience	0–5 years	65	20.8
	6–10 years	122	39.1
	Above 10 years	90	28.8
Education	Graduate	91	29.2
	Postgraduate	182	58.3
	Doctoral/Professional	39	12.5

The demographic details showed that the majority of the respondents were mid-career professionals, meaning that they had considerable experience in the industry, which also means they were in a good position to respond to the questions about the meaning and significance of the initiatives aimed at upskilling and reskilling. The postgraduate representation also fitted the typical profile of employees in India's IT sector.

RELIABILITY ANALYSIS

Constructing the measurement scales showed an internal consistency. For the main constructs, the Cronbach's alpha reliability test was undertaken. Table 2 indicates that all variables were above the alpha value of 0.70 for reliability.

Table 2: Reliability Statistics of Major Constructs

Construct	Number of Items	Cronbach's Alpha (α)
Upskilling and Reskilling Exposure	8	0.86
Digital Skill Competency	7	0.89
Perceived Reduction in Skill Gap	6	0.84
Overall Scale	21	**0.88**

All constructs exhibited excellent internal consistency ($\alpha > 0.80$). The overall scale reliability coefficient of 0.88 confirmed that the instrument used for measuring the constructs was statistically robust and suitable for further analysis.

DESCRIPTIVE STATISTICS OF KEY VARIABLES

Descriptive statistics were computed to summarize the central tendency and variability of the main variables.

Table 3: Descriptive Statistics for Key Study Variables

Variable	Mean (M)	Standard Deviation (SD)	Minimum	Maximum
Upskilling and Reskilling Exposure	3.96	0.73	1.80	5.00
Digital Skill Competency	4.02	0.68	2.00	5.00
Perceived Skill Gap Reduction	3.88	0.70	1.90	5.00

Respondents reported high levels of exposure to upskilling and reskilling programs (M = 3.96), reflecting the increasing integration of continuous learning initiatives in Indian IT organizations. The mean score for digital skill competency (M = 4.02) suggested that most employees perceived themselves as digitally proficient. Similarly, the mean score for perceived skill gap reduction (M = 3.88) indicated moderate to strong improvement in workforce digital readiness following participation in learning programs.

CORRELATION ANALYSIS

To test the hypothesis that upskilling and reskilling programs are significantly associated with reduced digital skill gaps, Pearson's correlation analysis was performed.

Table 4: Correlation Matrix of Study Variables (n = 312)

Variables	1	2	3
1. Upskilling & Reskilling Exposure	1		
2. Digital Skill Competency	**0.642****	1	
3. Perceived Reduction in Skill Gap	**0.584****	**0.671****	1

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

The analysis revealed a strong positive correlation between upskilling/reskilling exposure and digital skill competency ($r = 0.642$, $p < .01$), indicating that employees who participated more frequently in structured learning programs exhibited higher digital proficiency. Furthermore, a significant correlation was found between upskilling exposure and perceived reduction in skill gaps ($r = 0.584$, $p < .01$), suggesting that such initiatives effectively improved employees' confidence and digital adaptability. The strongest relationship was observed between digital skill competency and perceived skill gap reduction ($r = 0.671$, $p < .01$), confirming that employees with stronger digital skills were more likely to report lower perceived skill deficiencies. These correlations collectively support the study's central hypothesis that upskilling and reskilling interventions play a statistically significant role in reducing digital skill gaps in Indian IT firms.

PARTIAL CORRELATION ANALYSIS

To further validate the relationship between training participation and skill gap reduction, partial correlation was computed while controlling for education level and years of experience.

Table 5: Partial Correlation Controlling for Education and Experience

Controlled Variables	Correlation Between Variables	Partial r	Sig. (2-tailed)
Education & Experience	Upskilling Exposure – Digital Skill Competency	0.612	0.001
Education & Experience	Upskilling Exposure – Perceived Skill Gap Reduction	0.557	0.001

Even after controlling for education and experience, the relationships remained statistically significant ($p < .01$), confirming that the impact of upskilling and reskilling programs on digital skill development was not merely a function of prior academic background or work tenure. This finding provides strong evidence that structured skill development programs independently contribute to enhancing workforce capability.

The study shows that employees who take part in upskilling and reskilling programmes hold a higher level of digital competence and confidence in their ability to handle emerging technologies. The correlation and partial correlation analyses proved the relationships were strong and validated the primary hypothesis of the study - that systematic learning programmes narrow the digital skill gap. The results also showed that education and experience, while still relevant, did not outweigh the unique contribution of structured digital learning. Collectively, these findings show that systematic upskilling and reskilling is fundamental to maintaining workforce agility and competitiveness in India's IT industry.

DISCUSSIONS

This study focused on understanding the impact that upskilling and reskilling programmes have on bridging the digital skill gap among the employees of Indian IT companies. The

descriptive and correlational analyses conducted show that there is statistically significant evidence that structured learning programmes positively impact the digital competencies of the workforces and the perceived level of skill gap. These findings reinforce the arguments presented by Nizami, Tripathi, and Mohan (2022) and Feijao, Flanagan, Van Stolk, and Gunashekar (2021) that upskilling and reskilling interventions must be of the highest priority to sustain the competitiveness of the economy. The descriptive results show the high involvement of employees in Indian IT companies in upskilling and reskilling activities, evidenced by a mean score of 3.96 on a five-point scale. This means that in most companies, there are already systems in place for structured training that are aligned with the Skill India and FutureSkills Prime initiatives (NASSCOM, 2024). The mean score of 4.02 in digital skill competency and 3.88 in the perceived skill gap further support the notion that these initiatives are successfully improving the training of employees. This corresponds to the view of Jagannathan (2021), stating that for digital transformation to be sustainable in developing economies such as India, there must be ongoing learning and reskilling.

Analyses revealed a strong and statistically significant relationship between advanced exposure to upskilling/reskilling and competencies in digital skills ($r = 0.642$, $p < 0.01$) and reductions in perceived skill gaps ($r = 0.584$, $p < 0.01$). These results confirm the central hypothesis, which suggests that employees who actively engage in systematic training demonstrate greater competencies in the use of digital tools and technologies. This finding is consistent with Chakrabarti (2022) who stated that the more often an employee participates in training, the more digitally adaptable and higher performing they become. Likewise, Garg, Singh, and Tabassum (2025) stated that organisations that spend more than 3% of their annual budget on employee reskilling experience a skill gap reduction of up to 40%. This finding is consistent with the positive correlations found in this study.

Moreover, the strong correlation reported should be analysed with caution, as the association between digital skill competency and perceived skill gap reduction ($r = 0.671$, $p < 0.01$) shows that the more digital skills employees have, the more prepared and confident they feel. This aligns with Chakraborty, Konwar, and Chakrabarty (2025), for whom this psychological construct mirrors perceived self-efficacy, which is tied to the gap between training and workplace innovation. The partial correlation was significant even after controlling for the level of education and work experience, which suggests that the impact of upskilling and reskilling programmes transcends these variables, which concurs with Kallidukkil and Jayaraj's (2024) argument that the learning ecosystem works for all employees, regardless of their hierarchical layers.

The insights further enrich the theoretical landscape pertaining to Human Capital Development and Learning Organisation Theory. It is encouraging that the findings uphold Becker (1993) assertion, from a human capital perspective, that gains from employee training and learning are quantifiable in terms of improved organisational productivity and innovation. Most knowledge-intensive industries, including IT, benefit from learning as an assimilated form of capital. In the case of the IT sector, Senge (2006) reiterating the importance of organisational learning culture, the findings reinforce the importance of adaptability, agility, and continuous improvement. Indian IT firms, such as Infosys and TCS, that combine formal with experiential and peer training upskilling frameworks (Patel, 2023; Garg et al., 2025) illustrate this best. The results emphasise the need for policy-driven digital skilling initiatives in the context of national advancements. According to Feijao et al. (2021), and NASSCOM (2024), coordinated strategies to bridge the industry-academia gap were the principal reason for the nearly 27% improvement in digital readiness for India from 2018 to

2022. However, some challenges still persist. The descriptive results of the study showcased moderate variability (SD = 0.73) in exposure to upskilling, which indicates that smaller firms are likely to still have an absence of such initiatives. This concurs with the findings of Bhaaskaran (2024) and Ohlan (2023), who noted large gaps in infrastructure and resources between large corporations and small-to-medium IT enterprises. Furthermore, although employees recognised the importance of training, comments from the qualitative analysis (during the pilot testing) suggested that many training programmes are content-heavy and context devoid, not sufficiently aligned to the challenges of the actual projects.

At last, findings confirm global evidence that digital reskilling lessens the gap caused by the adoption of new technologies. For instance, Patre, Chakraborty, and Kar (2023) noted a 25% increase in post-training skill confidence, which closely resembles the perceived competency increase in this study, after engaging in EdTech-based professional learning. Likewise, Lakshmi, Durgude, and Chitra (2024) noted that adaptive learning based on artificial intelligence (AI) retention and job satisfaction significantly improved retention and satisfaction. Collectively, these findings reinforce the belief that upskilling and reskilling positively strengthen skill gaps and increase employee engagement, retention, and organisational resilience.

THEORETICAL AND PRACTICAL IMPLICATIONS

From a theoretical perspective, this research builds on the extant literature on strategic human resource development (SHRD) by empirically establishing the relationship between continuous learning and digital workforce agility. The findings underscore the notion that the primary function of upskilling and reskilling programmes is both learning interventions and strategic levers for the organisation to attain a sustainable competitive advantage. They advocate for the assertion that the digital transformation of a workforce requires the embedding of learning analytics, continuous feedback, and performance-based learning outcomes (Jagannathan, 2021; Chakraborty et al., 2025).

The study provides practically implementable insights for policymakers and business leaders. The findings suggest that for government agencies, more robust collaborations with academic institutions, industry, and training providers are needed to develop and harmonise digital competency frameworks. For businesses, the findings suggest that learning must be integrated into the business model and that training be tailored, flexible, and focused on objectives. HR managers are advised to use metrics such as post-training performance scores and project delivery timelines to assess training ROI to assess the effectiveness of learning. The findings suggest that employees who actively participate in ongoing training will gain more confidence, be more adaptable to changing digital environments, and will be able to sustain their careers for longer.

LIMITATIONS

The study is not without some flaws even after considering the methods used. Because the study used self-reported data, there is a possibility of response bias since participants may have inflated their perceptions of their own digital skills. As a result of the research design being cross-sectional, there are limitations on the types of causal inferences that can be drawn; longitudinal studies are more suited to measuring the impact of reskilling on the advancement and performance of careers over a sustained period of time. Even though the sample was diverse, it was limited to employees of IT organisations in India. As a result, the findings may not be applicable to other regions or industries. In addition, the study assessed participants' perceived improvement of their digital skills, but failed to include tangible

assessments of participants' skills after the training, which could have further supported the validity of the study. In future studies, more mixed methods research that integrates quantitative and qualitative data, such as surveys and interviews or performance data, should be utilised in order to triangulate findings.

RECOMMENDATIONS FOR FUTURE RESEARCH

Future research should incorporate longitudinal research design methods in order to see how career paths change as employees further develop their skill sets. Scholars might also look into the impacts of AI-Driven Adaptive Learning Models as potential mediating variables between the design of training initiatives and the training outcomes. Cross-sector studies (e.g. IT and manufacturing) may help contextualise differences in the effectiveness of reskilling initiatives. The use of qualitative research methods and interviews with HR leaders and employees may help to better understand the obstacles and sources of motivation, as well as the dynamics of the organisational learning culture. Lastly, the influence of government, industry, and academia collaboration on skill development outcomes may provide the greatest value in terms of informing the development of policies and digital workforce strategies.

CONCLUSION

There is little doubt that the findings of this study confirm that the implementation of reskilling and upskilling initiatives in the IT sector of India has been exponentially effective in reducing the digital skills gap. The identification and measurement of the positive relationships between the variables of gaining exposure to upskilling initiatives, digital competency, and a perceived reduction of the skills gap, empirically affirm that, within a structured learning framework, individual(s) can enhance their skill levels and the confidence they possess to use those skills. These results, like the findings of other scholars, affirm the importance of continuous learning as a driver of effective digital transformation (Feijao et al., 2021; Jagannathan, 2021). The study advances both theoretical scholarship and managerial practitioners by framing reskilling not as an operational singularity but as a persistent dynamic process necessary for the sustainability of an organisation's workforce. Given the relentless technological change, Indian IT companies need to treat upskilling as a continual investment in the organisation's human capital as a resource for adaptability, innovation, and a sustainable competitive advantage. In summation, closing the digital skills divide through reskilling is a critical imperative for India to retain its position as a dominant player in the global digital economy and to prioritise its workforce.

REFERENCES

1. American Psychological Association. (2020). *Publication manual of the American Psychological Association* (7th ed.). Washington, DC: APA.
   Chakrabarti, D. (2022). *Future of work and the importance of upskilling in India. NHRD Network Journal, 17*(3), 211–225. https://doi.org/10.1177/26314541221089988
2. Bhaaskaran, V. S. K. (2024). *Future of work and skill development. University News, 62*(4), 200–216.
3. Bommanavar, S. (2023). *Navigating the digital shift: Strategic reskilling and upskilling initiatives in the banking sector for a future-ready workforce.* Routledge.
4. Chakrabarti, D. (2022). *Future of work and the importance of upskilling in India. NHRD Network Journal, 17*(3), 211–225. https://doi.org/10.1177/26314541221089988

5. Chakraborty, S., Konwar, J., & Chakrabarty, N. (2025). *Talent management in the age of change: Reskilling as a strategic imperative. Journal of Marketing Studies.*

6. Feijao, C., Flanagan, I., van Stolk, C., & Gunashekar, S. (2021). *The global digital skills gap: Current trends and future directions.* RAND Corporation. https://www.rand.org/pubs/research_reports/RRA1533-1.html

7. Field, A. (2018). *Discovering statistics using IBM SPSS Statistics* (5th ed.). Sage Publications.
    Garg, A., Singh, S., & Tabassum, R. (2025). *Reskilling and upskilling in Indian organizations: HR strategies for the future of work. Advances in Management.*

8. Jagannathan, S. (2021). *Reimagining digital learning for sustainable development.* Springer.

9. Jaiswal, A., Arun, C. J., & Varma, A. (2023). *Rebooting employees: Upskilling for artificial intelligence in multinational corporations.* In *Artificial intelligence and the future of work* (pp. 72–91). Taylor & Francis. https://doi.org/10.4324/9781003377085-5

10. Kallidukkil, J., & Jayaraj, A. M. (2024). *Talent management strategy: Upskilling and reskilling of IT employees. Journal of Basic Science and Engineering, 12*(1), 45–60.

11. Khan, A., Sethi, S., Mustafa, S. N., & Bibi, M. (2025). *Bridging the skills in the age of AI gap: Strategies for upskilling and reskilling in higher education. Dialogue on Social Science Review, 9*(1), 45–62.

12. Lakshmi, S., Durgude, U., & Chitra, V. (2024). *The role of upskilling and reskilling for talent transformation in the era of AI.* Weser Books.

13. Nalhe, P. U., & Arts, S. K. (2025). *Upskilling and reskilling strategies for future-readiness in the ITES workforce. International Journal of Commerce and Management Studies, 9*(2), 95–110. https://ijcams.com/wp-content/uploads/2025/05/Paper13.pdf

14. NASSCOM. (2024). *FutureSkills Prime Impact Report.* NASSCOM India.

15. Nizami, N., Tripathi, T., & Mohan, M. (2022). *Transforming skill gap crisis into opportunity for upskilling in India's IT-BPM sector. The Indian Journal of Labour Economics, 65*(4), 103–122. https://doi.org/10.1007/s41027-022-00383-9

16. Ohlan, S. (2023). *Leveraging information technology and IT-enabled services for enhancing workforce readiness in India. Journal of Multidisciplinary Knowledge, 7*(2), 34–49.

17. Pandey, S. K., & Vishwakarma, S. S. (2024). *Reskilling and upskilling initiatives in the Indian industrial sector.* ResearchGate. https://www.researchgate.net/publication/382495677

18. Parmar, S. M., & Yankson, M. K. (2025). *An analysis of reskilling and upskilling in India.* ResearchGate. https://www.researchgate.net/publication/394083369

19. Patel, T. (2023). *Employee training and upskilling for digital roles for a SME company in IT sector.* Theseus Repository. https://www.theseus.fi/handle/10024/813470
    Patre, S., Chakraborty, D., & Kar, A. K. (2023). *The role of enablers and barriers in the upskilling and reskilling of users through professional skilling programs on EdTech platforms. IEEE Transactions on Learning Technologies, 16*(5), 876–891. https://doi.org/10.1109/TLT.2023.10329405