The Impact of Artificial Intelligence on Digital Employee Engagement

Abhilasha Dixit [1]
Rimjhim Jha [2]
Ruturaj Baber [3]
Prerana Baber [4]

Abstract

Purpose : This study aimed to investigate the impact of artificial intelligence (AI) on digital employee engagement, focusing on the roles of job autonomy and digital learning orientation. It sought to understand how these factors influenced employee engagement in a digital environment and the extent to which the meaningfulness of work mediated these relationships.

Design/Methodology/Approach : Data were collected from 527 individuals performing administrative jobs in the private service sector. The study utilized partial least squares structural equation modeling (PLS-SEM) to test the proposed relationships among job autonomy, digital learning orientation, and digital employee engagement with mediation of meaningfulness of work.

Findings : The findings indicated that job autonomy and digital learning orientation significantly and positively predicted digital employee engagement. However, the meaningfulness of work did not mediate the relationship between job autonomy, digital learning orientation, and digital employee engagement. The results of this study found that there was no significant relationship between the meaningfulness of work and digital employee engagement. This study also found that when the employees used digital tools, they often experienced feelings of loneliness and insecurity.

Practical Implications : The study suggested that the organization's role should always be focused on promoting digital tools. Organizations should emphasize enhancing job autonomy and encourage employees to engage in digital learning orientation, boosting digital employee engagement in the workplace.

Originality/Value : This study contributed to the literature considering the role of AI applications that directly influenced digital employee engagement by addressing the significant roles of job autonomy and digital learning orientation. It also emphasized the need for future research to explore the impact of the meaningfulness of work and the dependence on digital tools for employee performance.

Keywords : **job autonomy, digital learning orientation, meaningfulness of work, digital employee engagement**

JEL Classification Codes : M1, M50, M59

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[1] *Assistant Professor (Primary Author),* Amity Business School, Amity University, Gwalior - 474 012, Madhya Pradesh. (Email : abhilashaanu@gmail.com) ; ORCID iD : https://orcid.org/0000-0002-2647-4381

[2] *Assistant Professor,* Symbiosis Institute of Business Management, Nagpur Campus (Symbiosis International Deemed University, Pune), Village Mauje, Bhandewadi, Wathoda Layout, Nagpur - 440 008, Maharashtra. (Email : rimjhimjha1@gmail.com) ; ORCID iD : https://orcid.org/0000-0002-8886-5177

[3] *Associate Professor,* School of Business & Management, Christ University, Dharmaram College Post, Hosur Road, Bengaluru - 560 029, Karnataka. (Email : ruturajbaber@gmail.com) ; ORCID iD : https://orcid.org/0000-0001-5193-3271

[4] *Assistant Professor (Corresponding Author),* Symbiosis Law School, Noida Campus (Symbiosis International Deemed University, Pune), Block A, 47/48, Sector 62, Noida - 201 301, Uttar Pradesh. (Email : dr.preranababer@gmail.com) ORCID iD : https://orcid.org/0000-0002-7354-1516

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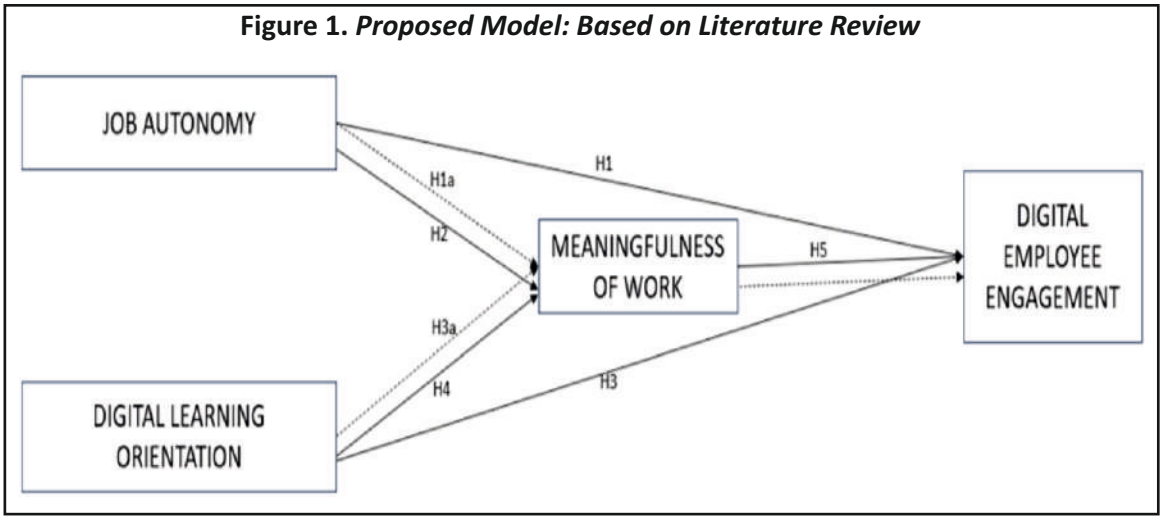
In the technologically dynamic era, workforce management is integrated with artificial intelligence (AI). AI is utilized as a tool to simplify the tasks within organizations. AI integration has doubled since the new decade's dawn (Chui et al., 2022). Companies utilize AI to improve operational efficiency, increase staff engagement, reduce employee turnover, transform the customer service experience, and achieve exceptional business results, such as increased revenue. AI is widely utilized in various sectors, such as manufacturing (with applications like Co-Bots and assembly line optimization), software development (with tools like Jasper, CopyAI, and Prowriting Aid), administration (with systems like LMS, chat GPT, and Bard), and numerous other industries. Nevertheless, using different AI tools is not limited to any particular industry.

Studies have indicated that AI applications affect customer experience, happiness, engagement, and employee loyalty (Li et al., 2021; Prentice et al., 2020). AI also influences employees' job efficiency and performance (Hughes et al., 2019; Prentice et al., 2023). Only a handful of studies offer empirical evidence of AI's influence on employee engagement (Dixit et al., 2023). Kahn (1990) conceptualized employee engagement as the physical, cognitive, and emotional inclination in job performance. While using various AI tools, employees are engrossed in finding meaningfulness while learning new things at work, feel empowered with the availability of resources, and sense safety with the tools assisting in decision-making (Aaradhi & Chakraborty, 2024). Therefore, the study seeks to identify various impacts of AI on digital employee engagement. It precisely captures three crucial factors from Kahn's (1990) perspective: job autonomy (the level of independence in the workplace), learning orientation (the emphasis on learning objectives), and meaningfulness of work (the perception of work as significant).

Scholars have yet to determine the implications of digital tools and their role in achieving meaningful work with positive contributions. Burnett and Lisk (2021) stated that digital tools had a negligible impact on the meaningfulness of work. In contrast, Mer and Srivastava (2023) discovered a significant positive relationship between digital tools, meaningfulness of work, and digital employee engagement. In their study, Dixit et al. (2023) have also urged future researchers to determine the appropriate predictors of digital employee engagement. Therefore, it is imperative to ascertain the relationship between the significance of work and employee's digital engagement level. Therefore, the objective of the study is to offer:

- An in-depth comprehension of the factors that lead to digital employee engagement in a digitally assisted environment.
- To study the relationship between job autonomy, digital learning orientation, the meaningfulness of work, and digital employee engagement (see Figure 1).

Figure 1. ***Proposed Model: Based on Literature Review***



Literature Review and Hypotheses Development

Digital Employee Engagement and Digital Learning Orientation

Utilizing digital tools and platforms to improve employee well-being, recognition, learning, and cooperation is commonly known as digital employee engagement. AI techniques and technology can significantly enhance engagement (Burnett & Lisk, 2021). AI-driven platforms can analyze large amounts of data to customize employee experiences, offer focused learning materials, and improve communication channels (Malik et al., 2022). Prikshat et al. (2023) explored various AI-powered chatbots that immediately assist employees, address typical HR-related inquiries, and optimize internal operations, leading to time savings and reduced stress. AI algorithms can evaluate employee feedback and sentiment data to detect patterns, highlight areas for improvement, and tailor engagement strategies to individual preferences and needs (Arora & Pratibha, 2022). This data-driven approach enables organizations to make informed decisions that enhance engagement and well-being.

Research on digital learning preferences indicated that this shift is driven by the need to develop tech-driven, spontaneous, and multi-sensory pedagogies (Halbusi et al., 2024). Aboobaker and Ka (2021) described that learning orientation involves enhancing skills, such as digital literacy, connectivity, multitasking, visual learning, and experiential learning, focusing on digital literacy. Studies have shown that a digital learning orientation boosts motivation and efficacy (Almusharraf & Bailey, 2021; Halbusi et al., 2024). Additionally, digital learning positively impacts work ethic, intellectual openness, self-evaluation, conscientiousness, motivation, creativity, and cognitive processes (Clark et al., 2016).

Job Autonomy and Digital Employee Engagement

Job autonomy enables employees to make decisions and encourages them to have their values at work. According to the prior literature, there is a direct association between digital employee engagement and job autonomy (Saks, 2006; Slåtten & Mehmetoglu, 2011). Grant (2008) revealed that employees were more engaged and motivated when they could control their job responsibilities and procedures and used digital technologies for collaboration, communication, and skill development. Robbins and Judge (2017) explored that the feeling of self-determination strengthened by job autonomy led to higher engagement of employees. Yagil and Oren (2021) identified a substantial need for studies that provide strategies and tools to enhance work autonomy and effective digital interactions for the upcoming digital era. So, based on the above discussion, the following hypothesis is proposed:

- **H_1 :** There is a significant relationship between job autonomy and digital employee engagement.

Job Autonomy to Meaningfulness-of-Work

The past literature explored the relationship between job autonomy and meaningfulness of work (Both-Nwabuwe et al., 2020; Lips-Wiersma et al., 2023; Martela et al., 2021). The concept of job autonomy signifies the degree of independence of employees and the level of self-determination while making decisions for their work assignments (Kidane & Xuefeng, 2021). Lips-Wiersma et al. (2023) found the degree of job autonomy as positively associated with the level of satisfaction, well-being and motivation among employees. Employees would find their work meaningful and satisfying when granted autonomy in decision-making and authority over their approach. Autin et al. (2021) indicated that the sense of meaningfulness arose from congruence between an individual's personal values, objectives, and independence in carrying out job responsibilities. Employees' job

autonomy and sense of meaning is considered beneficial for both the organization and its employees. Thus, relying on the above arguments, the following hypothesis is proposed:

↳ **H_2 :** There is a significant relationship between job autonomy and meaningfulness of work.

Digital Learning Orientation to Digital Employee Engagement

Aboobaker and Ka (2021) explored that in this digital era, consistent growth, cognitive skills, and employee satisfaction were directly influenced by digital learning orientation and employee involvement. Learning orientation leads to strong organizational commitment (Aboobaker & Ka, 2021). Almusharraf and Bailey (2021) revealed that learning orientations tended to allocate resources toward digital techniques and tools to support the employee learning process, expertise and further advancement of skills. Moreover, digital employee engagement strategies, including digital learning experiences, peer-to-peer recognition systems, and real-time feedback mechanisms, nurture a positive learning culture and braces employee engagement (Halbusi et al., 2024). Based on the above discussion, the following hypothesis is proposed:

↳ **H_3 :** There is a significant relationship between digital learning orientation and digital employee engagement.

Digital Learning Orientation to the Meaningfulness of Work

Prior research revealed a dearth of research to explore the relationship between digital learning orientation and the meaningfulness of work (Huang & Zhang, 2024; Zuo et al., 2019). Employers encouraging a digital learning culture allow employees to improve their skills, learn new technologies, gain new information, and do difficult jobs (Smids et al., 2019). These learning opportunities help employees feel competent, independent, and in control, all essential to productive engagement (Baber et al., 2023). The relevance of digital learning and development programs in the workplace showed that companies are concerned about their employees' personal and professional growth, increasing their jobs' significance (Morandini et al., 2023; Selimović et al., 2021). Hence, we propose:

↳ **H_4 :** There is a significant relationship between digital learning orientation and the meaningfulness of work.

Meaningfulness of Work to Digital Employee Engagement

Existing research has indicated that when employees engage with their work as meaningful, they exhibit higher engagement, motivation, and commitment toward their employers (Baber et al., 2021; Gode et al., 2019). In a digital era, the digital environment enables employees to gain meaningful work experiences (Kusumawati et al., 2024). As per the study by Opland et al. (2022), digital learning platforms can enhance employees' sense of determination in their work, thus leading to increased levels of digital employee engagement. A combination of meaningfulness of work and digital employee engagement initiatives is required to provide a gratifying work environment that supports employees' well-being and level of productivity (Hughes et al., 2019; Kusumawati et al., 2024). Hence, we propose:

↳ **H_5 :** There is a significant relationship between meaningfulness of work and digital employee engagement.

Meaningfulness of Work as a Mediator

The concept of meaningfulness of work includes different aspects like the significance of work, nature of work,

ability to work independently and a substantial contribution to organizational growth (Panda et al., 2021). Chaudhary and Akhouri (2019) and Lin et al. (2021) highlighted the implication of meaningful work in enhancing employee well-being, job satisfaction, employee engagement, and commitment that aligned with their values and aspirations. Lee et al. (2017) revealed that organizations with a strong learning focus significantly influenced employee engagement and work meaningfulness. Organizations prioritize digital learning orientation, where employees may learn new skills, take on challenging assignments, and make a difference in the company's objectives, boosting morale and productivity (Allan et al., 2016; Kusumawati et al., 2024). Many engaged, motivated, and dedicated personnel utilize digital tools and platforms to collaborate, communicate, and make valuable contributions within their organizations when they perceive their work as meaningful (Martela et al., 2021; Meng et al., 2020). Hence, by cultivating job autonomy, promoting learning orientation, and ensuring meaningfulness of work, organizations can potentially increase digital employee engagement and overall employee performance. So, based on the above arguments, the following hypotheses are proposed:

↳ **H_{1a} :** Meaningfulness of work mediates the relationship between job autonomy and digital employee engagement.

↳ **H_{3a} :** Meaningfulness of work mediates the relationship between digital learning orientation and digital employee engagement.

Research Methodology

Research Instruments

This study adapted standard scales for the measurement of constructs. The scales were altered per the current research's requirements, emphasizing digitalization (Table 1). Employee engagement was measured by the scale proposed by Schaufeli and Bakker (2004); learning orientation was measured by Vandewalle (1997); job autonomy was measured by Voydanoff (2004), and meaningfulness of work was measured by Steger et al. (2012) on 5-point Likert scale from strongly always to never.

Sample Design and Data Collection

This study aimed to identify AI's role in digital employee engagement by identifying its antecedents with exploratory research methodology. The study's target population was administrative employees employed in the private sector, available on LinkedIn. The sample consisted of employees from different streams, i.e., 28% IT employees, 33% HR employees, and 39% office assistants. The questionnaire was shared online, and the sample was selected through a random sampling method. The researchers floated questionnaires on the email id of 700 employees. The respondents were assured that this survey was for research purposes only and that confidentiality was maintained. Finally, 527 questionnaires were filled and returned; thus, the response rate was 75.25%. The

Table 1. ***Sources of Instrument***

Construct	Number of Items	Source
Digital Employee Engagement	8	Schaufeli & Bakker (2004)
Digital Learning Orientation	6	Vandewalle (1997)
Job Autonomy	3	Voydanoff (2004)
Meaningfulness of Work	5	Steger et al. (2012)

average age of the respondents was 27, and the female-respondent ratio was 3:2. Regarding qualifications, 51.6% of employees were graduates, and 48.4% were postgraduate.

Analytical Methods

We adopted a PLS-based technique, as PLS is a tool used for predictive modeling, emphasizing the relationship between latent variables and their indicators. Researchers also consider it a choice when the sample size is small and assumptions for normality are not followed (Dijkstra & Henseler, 2015; Hair et al., 2011).

Measurement Model Assessment

This study followed a structured data analysis design, starting with evaluating the measurement model using PLS-SEM; certain rules of thumb served as a guideline to assess and interpret results (Hair et al., 2019; Henseler et al., 2016). Considering Hair et al. (2019) and Henseler et al. (2016) constructs, job autonomy, digital learning orientation, meaningfulness of work, and digital employee engagement were first assessed for their reliability and validity.

The factor loadings and average variance explained (AVE) for the examined variables were above the threshold values (> 0.50). The value of Cronbach's Alpha reliability coefficient, Rho_A, and composite reliability is also above 0.70. The results confirmed the presence of convergent validity among the variables examined in the study (Hair et al., 2019). The complete results of the convergent validity and reliability of all variables are presented in Table 2.

Table 2. ***Loadings, Reliability, and Construct Validity***

Constructs	Items	Outer Loadings	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Digital Employee	*DEE1*	0.626	0.865	0.873	0.895	0.517
Engagement *(DEE)*	*DEE2*	0.760				
	DEE3	0.802				
	DEE4	0.634				
	DEE5	0.726				
	DEE6	0.792				
	DEE7	0.716				
	DEE8	0.676				
Job Autonomy *(JA)*	*JA1*	0.591	0.700	0.769	0.832	0.630
	JA2	0.889				
	JA3	0.866				
Digital Learning	*DLO1*	0.827	0.877	0.890	0.908	0.626
Orientation *(DLO)*	*DLO2*	0.864				
	DLO3	0.849				
	DLO4	0.773				
	DLO5	0.813				
	DLO6	0.586				

Meaningfulness of Work *(MOW)*	*MOW1*	0.896	0.869	0.872	0.919	0.792
	MOW2	0.902				
	MOW3	0.872				

Table 3. ***Discriminant Validity (HTMT Ratio)***

	Digital Employee Engagement	Job Autonomy	Digital Learning Orientation	Meaningfulness of Work
Digital Employee Engagement				
Job Autonomy	0.299			
Digital Learning Orientation	0.544	0.277		
Meaningfulness of Work	0.299	0.286	0.262	

Henseler et al. (2016) advise using the Heterotrait-Monotrait ratio of correlations (HTMT ratio) to assess the measurement model and indicate the presence of discriminant validity. HTMT has higher specificity and sensitivity than other methods (Ab Hamid et al., 2017). HTMT varies from 0 to 1. This study has no discriminant validity issues with HTMT values (refer to Table 3).

Assessment of Structural Model

Assessment of the structural model includes measurement of the coefficient of determination ®²), which measures variance explained in each endogenous construct, suggesting a model's explanatory and predictive power (Hair et al., 2019). The results indicate that job autonomy and digital learning orientation caused an 8.9% (0.089) variance in the meaningfulness of work. Also, the results indicate that job autonomy and digital learning orientation cause a 26.7% (0.267) variance in digital employee engagement.

Moreover, the hypothesized relationships of the study were assessed using the bootstrapping procedure. Bootstrapping is a non-parametric procedure to resample and evaluate the variability of a statistic by probing variability in the sample data (Streukens & Leroi-Werelds, 2016). The procedure created 5,000 resamples to obtain 5,000 estimates for each parameter in the model. This process is particularly appropriate for applied researchers since observed data usually do not meet restrictive assumptions such as normality in many statistical models (Kumar & Valarmathi, 2022; Streukens & Leroi-Werelds, 2016).

Hypotheses Assessment

All exogenous variables of the study proved to be significant and positive predictors of their specified endogenous variables except "meaningfulness of work," which is associated insignificantly with digital employee engagement. Results demonstrated in Table 4 that job autonomy significantly and positively predicted digital employee engagement ($\beta = 0.113$, $p = 0.034$); therefore, hypothesis H_1 is accepted. These study results are supported by Kidane and Xuefeng (2021) and Hai and Park (2024). Further, job autonomy significantly and positively predicts the meaningfulness of work ($\beta = 0.193$, $p = 0.002$). Hence, H_2 is accepted and matched with Lips-Wiersma et al. (2023). Digital learning orientation also positively and significantly predicted digital employee engagement ($\beta = 0.423$, $p = 0.000$); thus, H_3 is accepted. Moreover, digital learning orientation significantly and positively predicted digital employee engagement ($\beta = 0.192$, $p = 0.004$), and H_4 is accepted. However, the meaningfulness of work stands insignificant in predicting digital employee engagement ($\beta = 0.142$, $p = 0.089$), and H_5 is rejected. The results indicate that employees' perception of security and support is

Table 4. ***Testing Direct Relationships***

S. No.	Hypotheses Paths	β-value	*t* - Statistics (|O/STDEV|)	*p*-values	Status
H_1	*JA* → *DEE*	0.113	2.123	0.034	Accept
H_2	*JA* → *MOW*	0.193	3.166	0.002	Accept
H_3	*DLO* → *DEE*	0.423	5.585	0.000	Accept
H_4	*DLO* → *MOW*	0.192	2.878	0.004	Accept
H_5	*MOW* → *DEE*	0.142	1.701	0.089	Not Accepted

Note. r^2 = *DEE* (0.267); *MOW* (0.083).

strengthened with the integration of AI along with the presence of co-workers at their workplace (Sadeghian & Hassenzahl, 2022; Singh & Atwal, 2019).

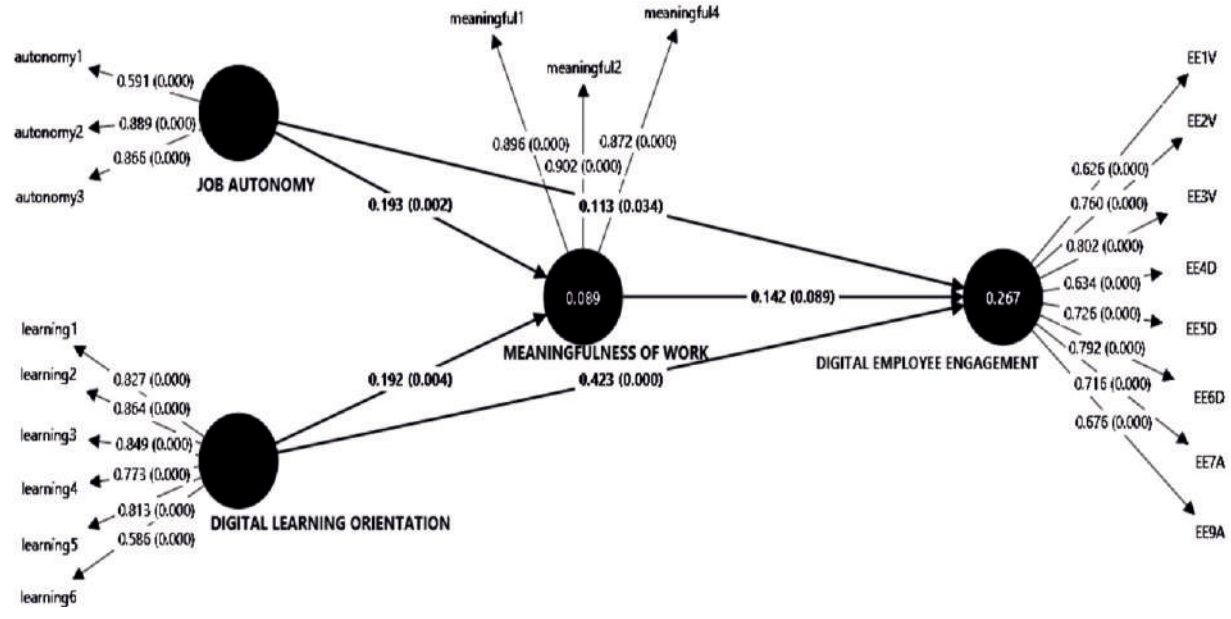
Mediation Analysis

In order to examine the mediation of meaningfulness of work in determining digital employee engagement, we employed the bootstrapping technique to assess the specific indirect effect and decide on its statistical

Table 5. ***Testing Indirect Relationships***

S. No.	Proposed Relationship	Specific Indirect Effects	*t*-statistics (|O/STDEV|)	*p*-values	CI. 2.5%	CI. 97.5%	Status
H_{1a}	*JA* → *MOW* → *DEE*	0.027	1.322	0.186	–0.003	0.076	Reject
H_{3a}	*DLO* → *MOW* → *DEE*	0.027	1.520	0.129	–0.004	0.066	Reject

Figure 2. ***PLS Model: Outer Model (Outer Loadings & p-value) and Inner Model (Path Coefficient, R^2, & p-value)***



significance. The study examined the relationship between job autonomy and digital employee engagement via meaningfulness of work. Similarly, it assessed the relationship between digital learning orientation and digital employee engagement via meaningfulness of work. It reveals surprising results showing zero mediation of meaningfulness of work in determining digital employee engagement. Table 5 describes the indirect effect, the corresponding insignificant values, and the confidence interval, including zero in between. Therefore, the study reported that employees could not develop meaningfulness of work with AI integration at work. Additionally, it does not mediate the proposed relations, showing any indirect relationship between job autonomy and digital learning orientation over digital employee engagement. The results have been reported in the PLS model (Figure 2), showing *p* values, path-coefficient, and *R*-square.

Discussion

The research aims to examine the impact of AI on digital employee engagement from Kahn's (1990) perspective. The study explored the relationship between job autonomy and digital employee engagement. The ability to exercise autonomy in performing tasks and decision-making inspires employees, implanting a sense of ownership and dedication to their work and increasing engagement with digital platforms. A significant positive relationship between job autonomy and digital employee engagement is considered as our first hypothesis H_1, and the study supports the expected positive and significant link between these. Our study's results align with previous research (Bošković, 2021), showing that increased autonomy in the workplace encourages higher levels of engagement with digital work environments, especially in remote situations in congruence with Kidane and Xuefeng (2021), which discussed the importance of job autonomy and showed a positive link between autonomy and employee engagement. Smids et al. (2019) highlighted the significant impact of digitization on job autonomy and decision-making processes in the workplace, which can lead to meaningfulness and employee engagement. The unexpected finding in our study questions our assumptions about the mediating role of meaningfulness in the relationship between job autonomy and digital employee engagement. Surprisingly, H_{1a} is rejected, emphasizing the broader consequences of technological development on well-being rather than employee engagement.

Symon and Whiting (2018) investigated the concept of techno-invasion, which is the negative experience of employees leading to frustration and a decline in the perceived meaningfulness of work. Some negative consequences of freedom of choice, such as distress and work overload, question the meaningfulness of the work (Regy & Malini, 2019; Wood et al., 2018). H_2 shows a significant relationship between job autonomy and the meaningfulness of work. It highlights the significant impact of job-autonomy perception of employees about their roles in the era of digitalization. The findings of the study align with a previous study (Den Hartog & Belschak, 2012; Leach et al., 2003; Sung et al., 2022), stating a significant and positive correlation between job autonomy and psychological meaningfulness. Employees offered autonomy in their roles are likelier to find their work meaningful as they match their jobs with their values and interests. Hughes et al. (2019) demonstrated the significant contribution of AI tools to employee engagement. Therefore, providing job autonomy improves the work experience and creates a sense of meaningfulness of work in employees' roles, which leads to improved organizational performance and well-being. The findings support ongoing learning and skill development to encourage employee engagement in digital environments. Here, H_3 depicts a significant association between digital learning orientation and digital employee engagement. Hughes et al. (2019) explored that implementing AI boosts employee engagement.

Lee et al. (2021) emphasized that companies can improve work engagement by designing user-friendly learning platforms and providing online content to improve employees' performance. The results indicate the significant role of learning and digital learning orientation in nurturing and developing employee engagement within digital environments. Surprisingly, H_{3a}, which is rejected, states that meaningfulness of work does not

mediate the relationship between digital learning orientation and digital employee engagement. The finding aligns with those of Bergdahl et al. (2018), who explained that digitalization causes many problems, ranging from notification distraction to inadequate learning activities. Technological limitations also hinder the ability to engage employees. Hence, modern digital workplaces become an integral part of employees' attitudes and behaviors. Indeed, the techno-invasion perception may further help justify the factors of fragmented work tasks and work-life balance disruption that might make the meaningfulness-of-work perception less significant (Durward et al., 2019; Rothausen & Henderson, 2018).

Therefore, more studies are needed to better understand the digital workplace kinetics and their impact on employee engagement by adding "meaningfulness of work." On the other hand, H_4 is accepted and shows the importance of digital learning orientation in finding meaning in work. In the end, the results show the expected significant and positive correlation between digital learning orientation and the meaningfulness of work. Our results align with other studies, such as those by Lin et al. (2021), where people described learning orientation as having psychological significance on their work, leading toward engagement. Further, the results confirm that employees actively participating in digital learning initiatives are more likely to find meaning in their work and value for the organization. The study realizes that employees must enrich their jobs to find "meaningfulness of work." However, considering the role of AI, the meaningfulness of work contradicts the proposed relation with digital employee engagement. It suggests that more research is required to refine the association between digital learning orientation, meaningfulness of work, and digital employee engagement.

Managerial Implications

The study has several important implications for management. For starters, organizations can boost employee engagement by emphasizing the value of job autonomy. This entails giving employees more control over their work tasks and decisions, which can foster a greater sense of ownership and accountability. Organizations promoting continuous learning can inspire employees to develop their skills and share knowledge, increasing engagement and productivity. Aligning job responsibilities with personal values and goals can improve job satisfaction and overall well-being, emphasizing the importance of finding meaning in one's work. Ensuring employees see the value in their roles can result in a more motivated and dedicated workforce. Maximizing digital tools in the workplace can significantly improve communication, collaboration, and feedback, resulting in a better employee experience and organizational success. Digital tools can enable real-time communication, streamline processes, and provide platforms for collaborative work, all essential in today's workplace.

Promoting a digital learning orientation encourages employees to embrace new learning opportunities and increases the meaning of their work (Vatsa & Bhatnagar, 2021). This can be accomplished by providing continuous learning programs and fostering an environment where learning and development are prioritized. However, the study raises an important point: employees who rely heavily on AI tools may not remain digitally engaged. Excessive use of AI-powered assistants, such as chatbots, can create feelings of insecurity and loneliness among employees. Addressing this concern is critical in maintaining a healthy and supportive digital work environment. Managers should ensure that AI tools supplement, rather than replace, human interaction, fostering a sense of belonging and connection among employees. Organizations should be aware of the potential adverse effects of AI on employee well-being. Managers should implement strategies to mitigate these effects, such as offering assistance to employees who feel isolated or insecure and encouraging a healthy work-life balance. Regular breaks, social interactions, and providing employees access to mental health resources can all help mitigate the adverse effects of a heavy reliance on AI tools. Organizations should continuously evaluate and adapt their digital engagement strategies. Managers can improve their strategies by regularly assessing employee feedback and engagement levels. This proactive approach can help maintain high levels of engagement while avoiding issues associated with the overuse of AI tools.

Theoretical Implications

AI's role in the organization can potentially affect digital employee engagement. Chatbots and virtual assistants are common AI-powered technologies that have transformed employees' interaction practices with work (Zel & Kongar, 2020). The integration of AI-enabled tools optimizes human resource procedures. Artificial intelligence systems have become a crucial factor that reduces the burden of repetitive tasks and automates tasks, such as recruitment, performance management, and training. Enabling AI in the organizations' HR system reduces the burden on employees and motivates them to dedicate their time and skill to more strategic decisions that enhance the level of employee engagement (Dash & Chakraborty, 2021; Malik et al., 2022; Nawaz et al., 2024).

Furthermore, AI-powered virtual assistants can offer customized assistance and feedback to employees, addressing their specific requirements and preferences. The outcome of these changes leads to higher levels of job satisfaction and increased productivity (Zel & Kongar, 2020). Integrating artificial intelligence (AI) into the workplace effectively increases employee engagement, providing compelling observations on employee behavior, sentiment, and performance. Such practices allow organizations to customize their engagement strategies further efficiently (Patra et al., 2019). Artificial intelligence (AI) is utilized in the organization's different platforms to analyze data and detect patterns. Human resources (HR) can develop intensive initiatives that provide employees with discrete necessities and preferences, promoting a more engaged and motivated digital workforce of efficient employees (Polisetty & Sheela, 2023). Systematic planning and transparent communication practices with employees are crucial to ensure a continuous transition and the effective implementation of AI-powered engagement strategies in the organization.

Conclusion

In conclusion, this study examines the relationship between AI and digital employee engagement. It studies how the meaningfulness of work functions as a mediator between job autonomy and digital employee engagement, as well as between digital learning orientation and digital employee engagement. The study highlights the complex dynamics of AI integration in the digital work environment. The results underscore the importance of job autonomy and a focus on digital learning in promoting employee engagement. While job autonomy fosters a sense of ownership and commitment on the part of employees, digital learning orientation improves tool competency and increases engagement with digital platforms. The integration of AI also dramatically increases employee engagement. This emphasizes how complicated the dynamics of the digital workplace are and how much more study is necessary to understand the variables affecting worker engagement in these settings. These results offer insightful information that will help HR managers and companies successfully navigate the changing terrain of digital workplaces.

Limitations of the Study and Future Research Directions

The study is cross-sectional and relies on quantitative data. Longitudinal research is required to study the changing relationships between these variables over time and determine their long-term impact on employee outcomes and organizational success. Several prospective areas for future research in job autonomy, digital learning orientation, meaningfulness of work, and digital employee engagement can be explored. This study emphasizes private-sector employees; future studies may include public-sector employees. Cross-cultural research will shed light on cultural influences on engagement techniques, providing valuable insights into best practices across various organizational contexts. With a focus on promoting digital employee engagement and overall employee well-being, intervention studies can evaluate the efficacy of measures designed to increase job

autonomy, digital learning orientation, and meaningfulness of work. In the future, research can also look into several areas, such as integrating innovative technology, developing thorough measurement tools, and the effects of leadership.

Authors' Contribution

Dr. Abhilasha Dixit conducted the study considering the AI revolutions. Dr. Prerana Baber did an extensive literature review, identified keywords, and generated concepts. Dr. Rimjhim Jha verified the analytical methods and supervised the study. Dr. Prerana also emphasized the discussion based on the findings. Dr. Ruturaj Baber verified the proposed model using smart PLS. All the authors contributed to the primary data collection.

Conflict of Interest

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.

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Appendix

Appendix. ***List of Questionnaire Items***

Name of the Variable	Cronbach's Alpha	Items of the Scale	Factor Loadings	Source of Adopted Scale
Digital Employee Engagement *(DEE)*	0.865	At my work, I feel bursting with energy while using various digital tools.	0.626	Schaufeli & Bakker (2004)
		At my job, I feel strong and vigorous with usefulness of digital tools.	0.760	
		I am enthusiastic about my job while using various digital tools.	0.802	
		My job inspires me through using innovative digital tools.	0.634	
		When I get up in the morning, I feel like working with easy accessible digital tools.	0.726	
		I feel happy when I am working intensely using various digital tools.	0.792	
		I am proud of the work that I do with creative application of digital tools.	0.716	
		I feel difficult to detach myself from digital tools' applications.	Dropped	
		I am immersed in my work with the help of digital tools.	0.676	
Digital Learning Orientation *(DLO)*	0.877	I often use various digital tools related to my work to improve my ability.	0.827	Vandewalle (1997)
		I am willing to select a challenging work assignment that I can learn a lot from.	0.864	
		I often look for opportunities to develop new skills and knowledge.	0.849	
		I enjoy challenging and difficult tasks at work where I'll learn new skills.	0.773	
		For me, development of my work ability is important enough to take risks.	0.813	
		I prefer to work in situations that require a high level of ability and talent.	0.586	
Job Autonomy *(JA)*	0.700	I have the freedom to decide what I do on my job.	0.591	Voydanoff (2004)
		It is basically my own responsibility to decide how my job gets done.	0.889	
		I have a lot of say about what happens on my job.	0.866	
Meaningfulness of Work *(MOW)*	0.869	I view my work as contributing to my personal growth.	0.896	Steger et al. (2012)
		My work helps me better understand myself.	0.902	
		My work really makes no difference to the world.	0.872	
		My work helps me make sense of the world around me.	Dropped	
		The work I do serves a greater purpose.	Dropped	

About the Authors

Dr. Abhilasha Dixit is an Assistant Professor at Amity University, Madhya Pradesh. She has more than 10 years of academic experience at various reputed universities. Dr. Dixit has many publications in Scopus-indexed journals and UGC-CARE-listed journals. She has completed a PhD in human resource management after qualifying for UGC-NET in management. Dr. Dixit has been awarded a Doctoral Fellowship from ICSSR, New Delhi, India. She has a keen interest in research and innovation.

Dr. Rimjhim Jha is working as an Assistant Professor at Symbiosis Institute of Business Management, Nagpur (Symbiosis International (Deemed) University Pune). She specializes in HRM. Dr. Jha has published in national and international journals; some publications are listed in SCOPUS/ABDC.

Dr. Ruturaj Baber is an Associate Professor at the School of Business & Management, Christ University, Bengaluru, India. He specializes in consumer decision-making, research methodology, and market orientation. He has published over 50 papers in national and international journals and conference proceedings.

Dr. Prerana Baber is an Assistant Professor at Symbiosis Law School, Noida Campus. She specializes in managerial decision-making, consumer behavior, research methodology, and social media marketing. Dr. Baber has more than 10 published papers in ABDC, Scopus, Web of Science, Routledge, as well as national and international journals.