

Exploring the moderation of Adaptability and Digital Literacy in the impact of digital L&D systems on employee experience

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Abstract

The study looks at the way digital learning and development (L&D) systems affect employee experience in the Indian information technology sector, considering adaptability and digital literacy as factors that may moderate this relationship. Based on the Theory of Planned Behaviour, it makes use of survey data collected from 276 full-time employees employed in IT companies in Bengaluru, India. To test five hypotheses—those relating to the direct effect of digital L&D systems on employee experience, the direct effects of adaptability and digital literacy, and the moderating roles of these two factors, structural equation modelling was carried out using SPSS Amos. The results indicate that digital L&D systems have a significant impact on employee experience. Adaptability has both a positive direct effect and a positive moderating effect, which means that employees who are able to adjust well to digital changes obtain greater experiential benefits from digital learning systems. Digital literacy has a positive direct effect but a negative moderating effect, implying that employees who are highly digitally literate may rely less on formal digital L&D systems to influence their experience of the workplace. The study adds to the existing body of literature on digital L&D and employee experience by showing that the outcomes of technology-driven learning depend on the employees' level of behavioural readiness. In practice, the results recommend that organisations should combine their investments in digital learning with programmes aimed at improving adaptability and adopt a user-centred approach to learning design.

Keywords: employee engagement, digital literacy, adaptability, employee experience, digital L&D systems.

1. Introduction

Modern technological advancement in business ecosystems calls for an acceleration in the use of digital Learning and Development (L&D) systems. Digital L&D systems can be defined as those systems which facilitate unplanned and implicit process with unpredictable results using technological devices such as smartphones, tablets, and computers (Sousa & Rocha, 2019). The term finds roots in the concept of digital learning which was defined by (Anttila et al., 2012) as a tool to acquire digital teaching materials for learning activities. (Keane, 2012) was one of the earliest researchers to recognise that digital learning systems emphasise four essential aspects of learning: digital learning materials, digital tools, digital delivery, and autonomous learning. Although organisations have actively integrated digital learning systems for a while, the Covid-19 pandemic accelerated the rate at which digital tools were being used in functions such as sales, accounting, compliance, and ethics. Sometimes interchangeably used with “e-learning” and “online learning”, digital L&D systems are distinct in that they emphasise employee engagement and employee experiences (Hiremath et al., 2021; Sousa & Rocha, 2019).

a) Employee experience

Employee experience (EE) has been described in many different interpretations by different scholars, reflecting the complex nature of interactions in the organizations. Plaskoff (2017) defines employee experience as the holistic perception employees have about their relationship with their organization, based on all interactions across numerous touchpoints across the employee's experience. It includes personal perceptions that people form about their work environment, based on the diverse experiences that they might have had, occasionally or on a regular basis (Nair et al., 2024). With the rapid changes that organizations are undergoing, particularly with respect to hybrid work patterns, digital innovation, and all the disruptions, the need for employees to have a personalized employee experience is on the rise (Nair et al., 2024). To achieve and sustain a competitive advantage, organizations need to integrate human-centered design and employee experience focus in their organizational restructurings, with employees' emotions, aspirations, and expectations in mind (Başar, 2024). Studies find that if organizations pursue employee experience with as much passion as customer experience, they will create ripple effects such as improved organisational performance (Kimonyo, 2024; Mohanraj et al., 2024), innovation culture (Azevedo et al., 2020; Gheidar & ShamiZanjani, 2021; Tucker, 2020), increased rates of employee engagement (Lemon, 2019; Shenoy & Uchil, 2018; Turner, 2020), and enhanced customer satisfaction (Gustafsson et al., 2024; Pine, 2020).

To drive employee experience using digital learning and development systems, a number of tools are being used by businesses. Many are switching from traditional classroom-based training to online training by using a Learning Management System (LMS) (Kwon et al., 2021) and/or Learning Experience Platforms (LXP) (Kumar et al., 2025). Organizations are using online LMS platforms to support training programs, while 96% of large and medium-sized organizations use these systems, 81% of small organizations also adopted LMS technology (Freifeld, 2023). In addition to these tools, other tools like gamification has also proven to be technique that enhance the effectiveness of the learning process (Nair, 2023a). A study by Kulkarni (Kulkarni et al., 2022) suggested that it is important to incorporate the right game elements to have a positive impact on the training outcomes. Artificial Intelligence (AI) applications like adaptive learning systems (Kem, 2022) and generative AI and chatbots (Alhusban et al., 2024) improve learning and development by making learning personalised, increasing productivity, and increasing learner engagement, but still supports human trainers instead of replacing them (Tubaro et al., 2020). AI makes it easy to develop end-to-end learning modules, such as the method of L&D delivery and L&D program scheduling (Naim, 2023). The use of digital learning and development systems provide employees the independence to manage their work schedules effectively (Abdali et al., 2024; Noe & Ellingson, 2017), which, becomes beneficial in enhancing employee experiences by providing work life balance, hence contributing to an overall positive effect on digital transformation. It also plays a critical role in transforming work environments without affecting the foundational corporate values (Blštáková et al., 2020; Kravchuk et al., 2024; Panneerselvam & Balaraman, 2022). (Blštáková et al., 2020) elucidated how digitalisation is affecting corporate communication systems while keeping the core values of the firm intact. It also leads to meaningful work experiences, leading to better employee experiences. The relationship between digitalisation, core values, and employee experiences has also been studied by (García-Salirrosas et al., 2025) who found in their empirical investigation of Peruvian educational institutions that core values institutionalised by leaders influence employee experience and job satisfaction.

New-age digital learning and development systems include artificial intelligence (AI), Augmented Reality (AR), Learning Analytics (LA), Learning Management Systems (LMS), Massively Open Online Learning (MOOCs), social media, videoconferencing, Virtual Reality (VR), Virtual Instructor-Led Training (VILT), gamification, and Webinars (Gubbins et al., 2023; Kolář et al., 2023; Solberg Söilen, 2024). AI-enabled learning systems facilitate immediate feedback, improving the employee experience through spontaneous performance discussions and linking employee expectations with learning opportunities (Malik et al., 2023). Other features of digital learning and development systems, for example, e-learning modules which do not have a fixed time and place structure, provide employees with much autonomy in learning. Employees are given autonomy to improve their professional growth on various issues by learning from various experts. Therefore, digital learning systems are autonomous, self-contained, repetitive, low-cost, and flexible method of training (Rao, 2011).

It is essential for corporate employers to create employee engagement and employee experience strategies, particularly in the context of digital learning (Hiremath et al., 2021). As organisations invest in employees' professional growth through digital learning and development programs, positive employee experiences are cultivated, improving organisational performance. Therefore, the creation of a technological framework for an organisation goes a long way

in enhancing employee experiences. However, while extant current literature links digital L&D systems to productivity (Hiremath et al., 2021; Juliadi et al., 2023; Sousa & Rocha, 2019), employee satisfaction (Jafari Navimipour & Zareie, 2015; C.-Y. Lin et al., 2019), and employee engagement (Hamza & Tóvölgy, 2023; Hashem et al., 2022), it fails to explain how cognitive responses elicited by digital L&D systems affect employees' experience using the technology. Moreover, most of the existing studies explore the effect of each system in isolation rather than cohesively, leaving a critical gap for academicians and practitioners seeking a holistic investigation. Therefore, given the growing role of technology in creating modern workplace learning environments, as well as its ability to influence employees' experience and involvement in their development, it becomes essential to look into the relationship between digital L&D systems and employee experience. This leads to the first hypothesis of this study that can be stated as:

H1: Digital L&D systems impact employee experience

b) Adaptability

Building on the transformative effect of digital learning and development systems on employee experience, the roles of adaptability and digital literacy feature prominently in literature (Cetindamar et al., 2024; Mohammadyari & Singh, 2015; Shet, 2024). Sony & and Mekoth (2022) recognise adaptability as one of the determining factors for organisational success in the Industry 4.0 ecosystem which comprises nine main technologies: 'autonomous robots, system integration, the internet of things (IoT), simulation, additive manufacturing, cloud computing, augmented reality, big data, and cybersecurity'. They define employee adaptability as the capability to modify according to the requirements of the changing environment. It can also be defined as the behavior of assessing the effective acceptance and utilization of technology by employees within an organization (Rubel et al., 2017). Adaptability makes firms strong, innovative, and sensitive to changing customer needs.(Widodo, 2025). Technological adaptability is crucial for employees to remain competitive and efficient in the rapidly changing digital environment.(Wang et al., 2024). Moreover, organizational digital transformation requires employee active engagement in digital transformation (employee behavior), such as those who willingly and proactively contribute insights to digital participation initiatives (Rubel et al., 2023), calling on the need for greater adaptability to dynamic changes at the workplace.

The concept of adaptability gained prominence at the turn of the twenty first century with businesses entering a global and a digitally-connected age. (Pulakos et al., 2000) was one of the earliest to study it and opined that adaptability is represented by eight dimensions including the ability to deal with uncertain situations, handling crises, solving problems creatively, handling stress, learning new technologies and tasks, demonstrating interpersonal skills, demonstrating cultural adaptability, and demonstrating physical adaptability. With the pace of digitalisation fastening in commerce, adaptability has become more proactive than reactive, mandating employees to adjust to new work processes, structures, and cultures while aligning themselves with organisational goals (Surianto et al., 2024). (Koopmans et al., 2012) identify adaptability as an important characteristic of employees in modern organisations, referring to it as a core determinant of individual work performance. They stress on employees' ability to keep their knowledge and skills up-to-date, remain flexible, overcome setbacks, and coping with uncertainties.

However, while adaptability has been extensively linked to organisational and individual performances (Cullen et al., 2014; Tariq et al., 2011; Weiss & Merrigan, 2021), and job satisfaction (Pedro et al., n.d.; Sony & and Mekoth, 2022; Zacher & Griffin, 2015). The few studies which have shed light on the effect of adaptability on employee experience failed to account for the growing digitalisation and learning systems in the workplace. Hence, there is a need to collate and analyse employees' perspectives on the moderating role of adaptability in the impact of digital L&D systems on employee experience, represented by the below stated hypothesis.

H2: Adaptability moderates the impact of digital L&D systems on employee experience

c) Digital literacy

Skills, knowledge and abilities of an individual or social group utilized while engaging with digital technologies is referred to as employees' digital literacy (Stordy, 2015), which goes beyond conventional literacy understanding confined to mere ability to read, write and operate printed texts across different contexts (Littlejohn et al., 2012). (Ng, 2012) defines digital literacy as the ability to locate, comprehend, evaluate, and create information using digital technologies, and is another crucial component of employee experience. He proposed three dimensions of digital

literacy: cognitive (referring to the ability to search, evaluate, and handle digital information critically), technical (being able to connect and use input and peripheral devices such as earphones, external speakers, and smartboards, as well as possessing the operational skills to use ICT), and socio-emotional (being able to use the internet responsibly for communicating, socialising, and learning), which collectively contribute to the overall employee experience. Digital literacy is also seen as an enabler of adaptability by some researchers who assert that the more digitally literate an individual is, the easier it is for him/ her to adapt (Kadhim, 2024; Thelma et al., 2024). The growing amount of evidence on digital literacy in academia refers to digital literacy as employees' ability, knowledge, and skills to interact with digital technology (Dery et al., 2017; Khan & Vuopala, 2019). This points to its growing scope as a catalyst in greater organisational digitalisation outcomes rather than purely as a measurement tool for employees' awareness of technology. For instance, (Cetindamar et al., 2024) found that employees with strong digital literacy can gather information, share ideas creatively, and use technologies safely and efficiently, contributing to innovation. Similar findings were found in the studies of (Santoso et al., 2019; Soliman et al., 2022), reaffirming that the role of digital literacy extends beyond technical competence to fundamentally enhancing employee experience.

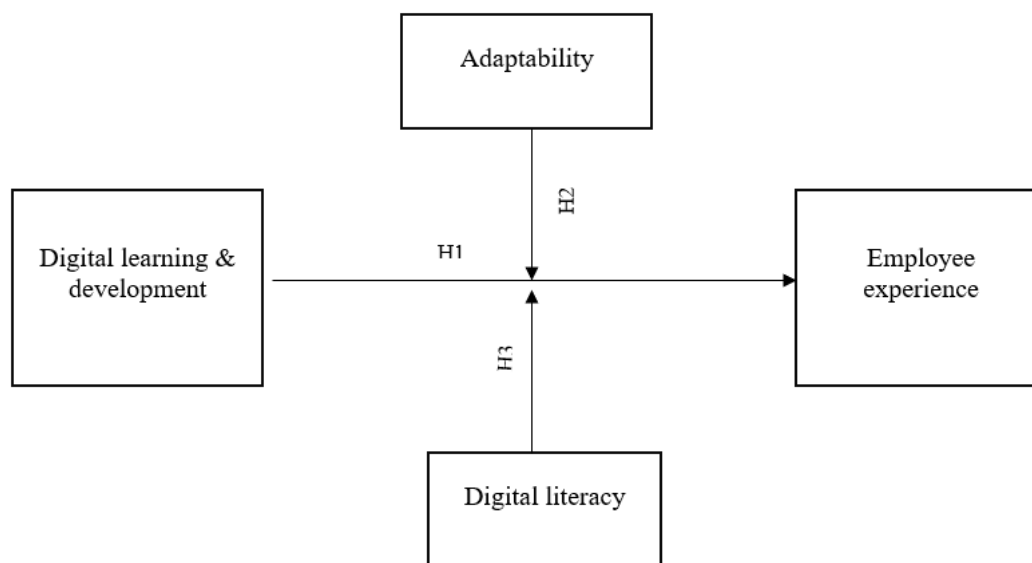
Moreover, as (Kaushal, 2022) explains, digital literacy is learning and understanding technology and its usage, which requires cognitive and technical skills. Since digital transformation has been made unavoidable in the contemporary world, consequently, there has to be a minimum level of digital literacy among workers is crucial so that organizations can achieve adequate performance in the area of digitalization and subsequent innovation (Tatli et al., 2023). Digital literacy of employees is very important for organizations during these digital developments (Vial, 2019). It is one of the main skills needed today to help manage the skills of people with what can be done using digital technologies. When employees' digital literacy gets better, they use digital technologies more effectively (Abedin et al., 2012). The management play a critical role in this digital literacy, find (Sacavém et al., 2025; Wang et al., 2024), asserting that they can help improve it and get their workers ready for future needs related to digital changes. By doing this, they can gain the support of their employees, helping them do better than competitors who see their employees just as machines, enhancing their overall satisfaction (Westerman, 2016).

d) Theoretical underpinning

The Theory of Planned Behaviour (TPB) posits that an individual's behaviour is shaped by three primary elements: attitude toward the behaviour (ATB), subjective norms (SN), and perceived behavioural control (PCB). ATB refers to an individual's stance towards performing a behaviour and can be positive or negative. SN refers to the perceived social pressure to perform the behaviour. Lastly, PCB refers to the individual's perceived capability to execute the behaviour. Developed by (Ajzen, 1991), the theory has been extensively used in academia and practice to explain how individual intentions translate into actions when influenced by internal and external factors (Kachkar & Djafri, 2021). In the context of this study, EE is viewed as the outcome of an individual's response to the digitalisation initiatives take by the organisation, particularly L&D systems. Research has shown that the effectiveness of L&D systems depends on employees' attitudes towards the digital tools (ATB) (Gao, 2019; Prior et al., 2016; Van Acker et al., 2013) and their adaptability and digital literacy (PCB) as noted above. Moreover, adaptability and digital literacy (PCB components) act as moderators because they represent the individual's capacity to manage and respond effectively to digital change; therefore, adaptable and digitally literate employees are more likely to have more positive experiences. This study therefore anchors its investigation in the TPB, providing a strong theoretical foundation to explain how individual traits of adaptability and digital literacy can have different outcomes for experiences of digital L&D tools.

As noted earlier, the available body of literature on the subject of digital literacy majorly explores its relationship with innovation, usage of digital technology (Cetindamar et al., 2024; Nikou et al., 2022), individual performance (Marsh, 2018; Mohammadyari & Singh, 2015), and firm performance (Anthony, 2023; Oladimeji et al., 2024; Sitaniapessy et al., 2024). Evidence of the role of digital literacy in curating employee experiences, particularly in context of digital learning and development systems, remains scant despite the growing usage of modern technologies in L&D. Therefore, this study explores the moderating role played by digital literacy in the impact of digital L&D systems on employee experience. Accordingly, the below hypothesis is stated, followed by the conceptual model of this study.

H3: Digital literacy moderates the impact of digital L&D systems on employee experience



The crucial questions addressed in this study are:

- Do digital L&D systems have an impact on employee experience?
- Do adaptability and digital literacy moderate the impact of digital L&D systems on employee experience?

2. Research methodology

a) Empirical investigation of the IT industry

The Indian information technology (IT) industry has become a major driver for the country's growing economy and has experienced phenomenal growth over the past few years, providing employment to nearly 3.5 million people (NASSCOM, 2015). Since there is a high demand of these employees, monetary incentive is not enough. These employees therefore look forward to development opportunities that enable their own personality growth and learning style. New generation employees prefer experiential, gamified, and flexible learning—like microlearning and virtual platforms—over classroom-based methods, thereby compelling multinational corporations to modify their learning and development strategy to accommodate their self-directed and interactive approach (Chaudhuri, 2018). The traditional approach to training was typically instructor-led classroom training. But with changing customer, business, and employee needs and the advent of technology, IT organizations have started replacing this traditional approach with new solutions like e-learning, group learning, virtual learning, social learning, collaborative learning, and personalized learning that can be customized based on one's pace, location, and device (Akerkar & Srivastava, 2017). As IT organizations adapt their L&D strategies to meet evolving employee expectations, the focus has also shifted toward designing a positive employee experience (EX) since it has a huge impact on improving employee retention and performance (Başar, 2024). Moreover, since India is a non-western society and many of the studies noted earlier were in context of western countries, its findings may not be generalisable to the Indian business environment. Given the intensifying competition for talent, it is crucial to determine the different roles played by digital L&D systems, adaptability, and digital literacy in curating employee experience. Therefore, our empirical investigation was conducted on this industry.

b) Sampling method

The study population encompasses all employees working in the IT sector of India. Evidently, India's population is too large. Using Pathak's (2013) and Du et al.'s (2023) recommendation in case of studies with an infinite population, we determine the sample size at 385 respondents because beyond that the primary data would fail to yield any new findings. Subsequently, data was collected from 21 IT sector companies located in the Bengaluru region of India. Small and medium scale companies employing at least 50 people were identified from public databases and

approached with an initial email explaining the intent of the study and the expected outcomes. They were also explained that the findings of this study would be used purely for academic purposes. From the 40 companies that we established a first contact with, 24 responded, out of which 21 eventually participated in the study. A Google form containing the survey questions was emailed to the correspondent from each company who then distributed to all qualifying employees of the firm. In this regard, 'qualifying employees' are those who have been working in the firm for at least one year in the executive, middle/ supervisory, or senior category. After repeated rounds of data collection spanning two weeks, 276 responses were received, bringing our final sample size to 276 respondents, showing a 72% response rate. The demographic profile of the respondents is represented in the table below.

Table 1: Demographic profile of survey respondents ($n = 276$)

Demographic aspect	Composition (%)
Age	
Between 20-30 years	10.1
Between 30-40 years	29.7
Between 40-50 years	43.1
More than 50 years	17.0
Gender	
Male	52.5
Female	47.5
Educational qualifications	
Graduate	36.2
Post graduate and above	38.4
Undergraduate/diploma	8.7
Others	16.7
Total work Experience	
Below 5 years	8.0
Between 5-10 years	30.4
Between 10-15 years	35.9
More than 15 years	25.7
Position	
Executive	40.6
Lead	27.9
Manager	31.5
Current company work experience	
Below 5 years	51.4
Between 5 and 10 years	48.6
Department	
Human Resources	12
Research & Development	7
Marketing/Sales	33
Finance/Accounts	10
Operations	38
No. of Employees in the firm	
30-50	24
50-75	55
More than 75	21

Total	100
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c) *Measurement instrument*

Questionnaire as a survey instrument was used to collect data of the respondents' perceptions regarding the digital L&D systems used in their workplace and its impact on their experience and the moderating effect of adaptability and digital literacy. While a survey instrument is defined as "any series of pre-defined questions intended to collect information from people, whether in person, by Internet, or any other media" (Phillips, 2017), a questionnaire is a structured data collection tool used in academic and applied social research (Kimberlin & Winterstein, 2008). The questionnaire was structured and close-ended containing two main sections; first pertaining to the demographic profile containing the elements noted in Table 1 and second the inferential section containing statements pertaining to the four main variables of digital L&D systems, employee experience, adaptability, and digital literacy, in Likert scale of 1 (strongly disagree) to 5 (strongly agree). The inferential section was aimed at testing the hypotheses and consisted of statements taken from existing scales, i.e. previously established research instruments.

Digital L&D systems: For the independent variable digital L&D systems, we used Bitrián et al.'s (2023) scale about the attributes of digital L&D systems such as e-learning, videos, and gamification. The original scale consisted of 22 statements but only 16 of those accurately represented the nature of this study and were therefore adopted. These are as follows.

Table 2: Digital L&D systems research instrument (DLD)

Statements	Code
Overall learning goals are presented in the beginning of the e-training	DLD1
Overall learning goals are clear to me	DLD2
Completing the different practical exercises (such as puzzles) is challenging	DLD3
The different practical exercises of the e-trainings are demanding	DLD4
While I am completing the e-training, I receive feedback on the progress made (such as chapters completed)	DLD5
While I am completing the e-training, I receive immediate information on my success (or failure)	DLD6
While I am completing the e-training, I receive information on my score	DLD7
While I was watching the videos, I could easily picture the events in them taking place	DLD8
I could visualize myself in the events described in the videos	DLD9
I was mentally involved in the videos while watching them	DLD10
I have fun completing the e-training	DLD11
I find the e-training enjoyable	DLD12
I find the e-training pleasant	DLD13
The e-training improves my information security and data protection behavior	DLD14
The e-training enables me to better react to potential cybersecurity threats	DLD15
The e-training is well structured	DLD16

Employee Experience: The dependent variable of this study was employee experience, for which Gavilan et al.'s (2013) scale measuring employee experience, also used by other researchers such as García-Salirrosas et al. (2025) was adopted. It consisted of 14 statements as shown in Table 3.

Table 3: Employee experience scale (EE)

Statements	Code
The corporate values of my company are positive for the employees	EE1
The corporate values of my company are positive for the customers.	EE2
I share the corporate values of my company.	EE3

I identify with the corporate values of my company.	EE4
I know the corporate values of my company.	EE5
I understand the corporate values of my company.	EE6
I have a good time working.	EE7
I have fun while working.	EE8
I enjoy doing my job.	EE9
I have a pleasant space to work in.	EE10
I like the place where I work.	EE11
The place where I work makes me feel good.	EE12
The place where I work helps me do my job well.	EE13
The corporate values of my company are positive for society.	EE14

Adaptability: Adaptability as an attribute of employees was a moderating variable. It has been extensively studied in literature therefore many scales exist. However we adopted (Koopmans et al., 2012) scale as it closely reflects the characteristics and purpose of this study. The scale is shown in Table 4 below.

Table 4: Adaptability scale (ADAP)

Statements	Code
I work at keeping my job skills up-to-date	ADAP1
I demonstrate flexibility	ADAP2
I am able to cope well with difficult situations and setbacks at work	ADAP3
I come up with creative solutions to new problems	ADAP4
I easily adjust to changes in my work	ADAP5

Digital literacy: the final moderating variable was digital literacy which refers to as the ability to locate, comprehend, evaluate, and create information using digital technologies, and is another crucial component of employee experience (Ng, 2012). In this case we adopted Ng's (2012) scale consisting of the following items.

Table 5: Digital literacy scale (DL)

Statements	Code
I know how to solve my own technical problems	DL1
I know about a lot of different digital technologies	DL2
I have the technical skills I need to use digital technologies for working/ learning and create artefacts	DL3
I am familiar with issues related to web-based activities like cybercrime	DL4
Digital technologies enable me to collaborate better with my colleagues	DL5

d) Data analysis method

Even before a relationship can be modelled before variables of the study, it is important to establish the validity and reliability of the constructs. In the case of this study, the validity and reliability were established for the four constructs i.e., digital L&D systems, employee experience, digital literacy, and adaptability using the measures of Cronbach's alpha, Composite Reliability (CR), convergent validity (AVE), discriminant validity (square root of AVE).

Cronbach's alpha: Cronbach's Alpha (α) assesses the internal consistency of a scale and reflects how closely related a set of items are as a group. A value of 0.70 or higher is generally considered acceptable (Forero, 2014).

Composite Reliability (CR) evaluates the reliability of latent constructs by accounting for the actual factor loadings rather than assuming equal weighting, as in Cronbach's alpha. Values above 0.70 indicate good reliability (Hamid et al., 2017).

Average Variance Extracted (AVE) measures the amount of variance captured by a construct relative to the variance

due to measurement error and should ideally be more than 0.50 (Fornell & Larcker, 1981).

Discriminant validity requires that the square root of the AVE for each construct be greater than the correlation coefficients with other constructs (Fornell & Larcker, 1981).

While the Cronbach's alpha test was conducted on SPSS 23.0 statistical package, CR, AVE, and discriminant validity tests were conducted using Confirmatory Factor Analysis (CFA) test in SPSS Amos 22.0 statistical software. Following that, the examination of the relationship between the variables and hypotheses testing was performed using Structural Equation Modelling (SEM) in SPSS Amos. SEM was preferred over other methods such as linear regression because it simultaneously tests the latent constructs and their relationships while accounting for measurement error. This increases the precision and robustness of the results (Hair et al., 2021). In addition to the 3 hypotheses noted earlier, the direct effect of adaptability and digital literacy on employee engagement was also test, bringing the total number of tested hypotheses to five as stated below. Inclusion of the direct effect in the SEM model helps avoid omitted variable bias, as failing to control for these main effects can distort the estimated moderation effects and inflate the interaction term's coefficient (Hair et al., 2021; Liu et al., 2025; Sardeshmukh & Vandenberg, 2017).

H4: Adaptability has an impact on employee experience.

H5: Digital literacy has an impact on employee experience.

3. Data analysis

The results from the CFA test performed in SPSS Amos software are presented in the table 6 below. The table also represents the Cronbach's alpha test showing the reliability of the scale.

Table 6: Reliability and validity of the constructs

Statement	Factor loading	CR	AVE	Cronbach alpha	Sqrt AVE
DLD16	0.915	0.95	0.55	0.94	0.74
DLD15	0.746				
DLD14	0.775				
DLD13	0.778				
DLD12	0.751				
DLD11	0.671				
DLD10	0.744				
DLD9	0.795				
DLD8	0.881				
DLD7	0.757				
DLD6	0.642				
DLD5	0.68				
DLD4	0.567				
DLD3	0.695				
DLD2	0.646				
DLD1	0.779				
EE1	0.507	0.94	0.55	0.94	0.74
EE2	0.587				
EE3	0.589				
EE4	0.61				
EE5	0.799				
EE6	0.797				
EE7	0.73				
EE8	0.839				

EE9	0.831				
EE10	0.817				
EE11	0.804				
EE12	0.762				
EE13	0.937				
EE14	0.622				
ADAP5	0.984	0.90	0.65	0.88	0.81
ADAP4	0.688				
ADAP3	0.777				
ADAP2	0.81				
ADAP1	0.741				
DL5	0.729	0.89	0.61	0.88	0.78
DL4	0.866				
DL3	0.819				
DL2	0.699				
DL1	0.775				

Further, results of the discriminant validity is represented in Table 7 below in the form of square root of AVE values. The discriminant validity of all the constructs is achieved as the sq. rt of AVE value is more than the pairwise correlation between the constructs. The table reveals that the strongest correlation is present between DL and EE (0.672). Thus, the reliability and validity of the scale is established with all the criteria being met, leaving us to proceed with the SEM test to check for the moderation effect.

Table 7: Discriminant validity

		DLD	EE	ADAP	DL
DLD	Pearson Correlation	0.744			
EE	Pearson Correlation	.507**	0.741		
ADAP	Pearson Correlation	.483**	.596**	0.806	
DL	Pearson Correlation	.415**	.672**	.617**	0.780

As noted earlier, the objective of this study is to explore the moderating effect of adaptability and digital literacy in the impact of digital L&D systems on employee experience. Employee experience is the outcome of a number of organisational factors, particularly the extent of digitalisation due to its numerous benefits such as curating employee experiences, enhancing job satisfaction, boosting employee engagement rates, and delivering better value to customers. This is the reason for studying the effect using SEM which takes into consideration the effect of the latent variables and moderation with simultaneous testing of complex relationships between observed and latent variables. The structural model developed in SPSS Amos to this effect is represented below.

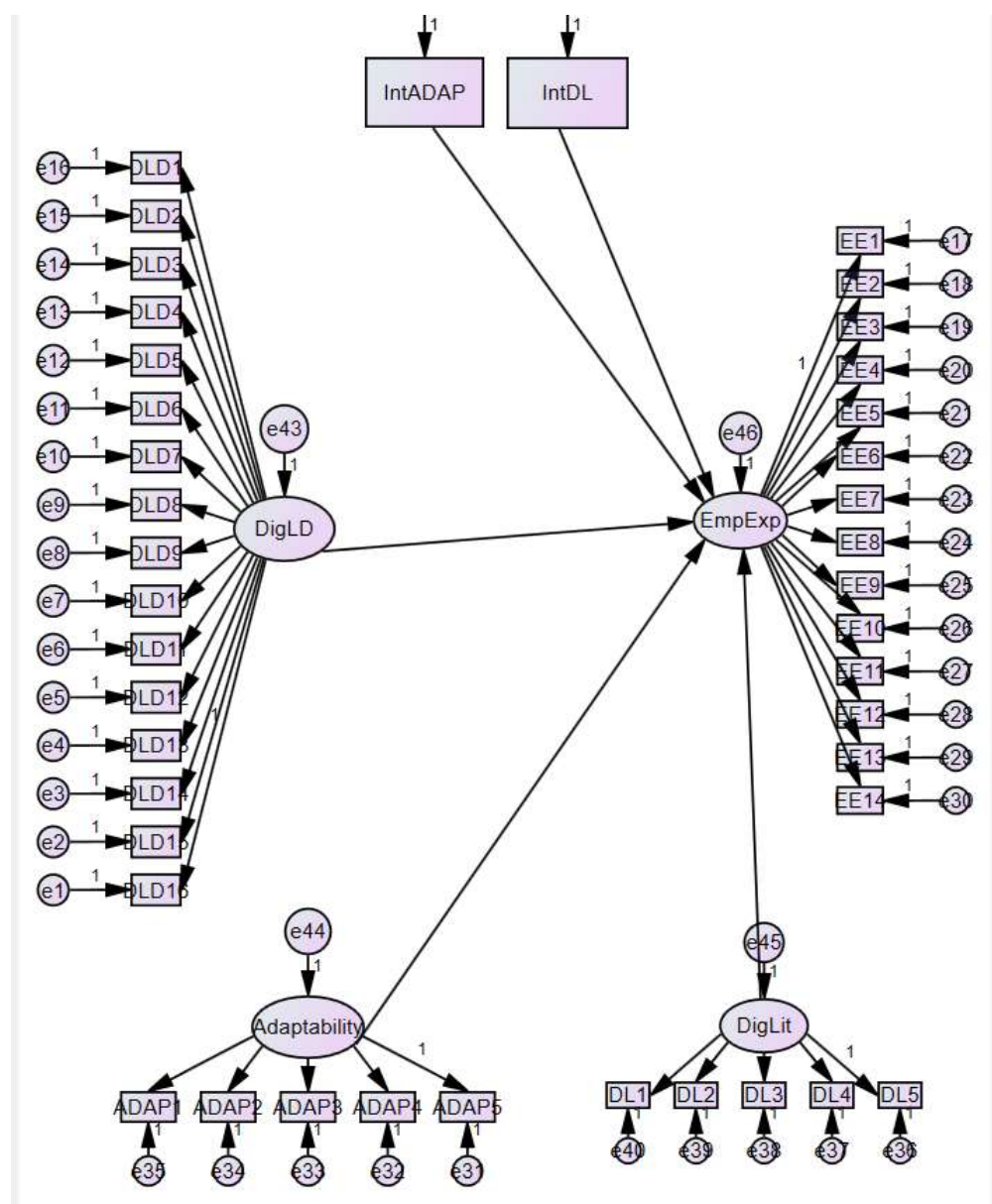


Figure 2: Structural model

The results of the structural model were semi-satisfactory as although the model fit was achieved, several other indicators were slightly below the recommended threshold value.

Table 8: Indicators of SEM model fitness (Dash & Paul, 2021)

Indicator	Definition	Acceptable value
CMIN/ df	The chi-square statistic divided by degrees of freedom provides a relative measure of model fit.	Up to 5
PCFI	An adjusted version of the CFI that incorporates model parsimony by accounting for model complexity.	>0.5
PGFI	A parsimony-adjusted version of GFI. The simpler the model, the better.	>0.5

PNFI	A variation of NFI that adjusts for the number of estimated parameters. Simplicity is preferred.	>0.5
RMSEA	An absolute fit index reflecting model misfit per degree of freedom.	<0.06
CFI	An incremental fit index comparing the target model to a null model.	>0.90
TLI	An index similar to CFI but accounting for model complexity.	>0.80
NFI	An incremental index comparing the specified model to a null model.	>0.90
IFI	Measures improvement over a baseline null model with adjustment for fit and complexity.	>0.90

The results from our SEM test show PGFI score of 0.52, indicating that the model is not complex. The PNFI and PCFI scores are 0.612 and 0.658 respectively, again meeting the threshold values of 0.5 and again proving that the model is simple. The RMSEA score was 0.118, meeting the criteria for absolute fit index reflecting model misfit. The CMIN/df score was 4.861, indicating good model fit. However the CFI, TLI, NFI and IFI scores were 0.695, 0.678, 0.645, and 0.696 respectively, falling below the recommended value of 0.9. Such values can still be considered acceptable in complex models or with smaller sample sizes, where some authors recommend that lower values of around 0.7 are often applied in practice (Dash & Paul, 2021; Kim et al., 2016). Therefore, although our SEM model captures the structural relationships, it remains sufficiently plausible to support hypothesis testing. As noted earlier, this model tests five hypotheses. The results from the hypotheses testing is represented in the table below.

- H1: Digital L&D systems impact employee experience
- H2: Adaptability moderates the impact of digital L&D systems on employee experience
- H3: Digital literacy moderates the impact of digital L&D systems on employee experience
- H4: Adaptability has an impact on employee experience.
- H5: Digital literacy has an impact on employee experience.

Table 9: Regression results

Hypothesis			Estimate	S.E.	C.R.	P	Result
EE	<--	DLD	0.166	0.038	4.32	***	Accepted
EE	<--	IntADAP	0.054	0.02	2.764	0.006	Accepted
EE	<--	IntDL	-0.13	0.028	4.593	***	Accepted
EE	<--	ADAP	0.091	0.033	2.707	0.007	Accepted
EE	<--	DL	0.399	0.062	6.462	***	Accepted

The table represents the estimates value, Standard Error value (SE), and the t and p values. The Estimate represents the strength and direction of the relationship between two constructs. It shows the expected change in the dependent variable for every unit change in the independent variable. The estimate value between most of the constructs are positive and between 0.1 and 0.4, suggesting a moderate positive relationship. However, the moderating effect of digital literacy (IntDL) is negative, suggesting an inverse relationship, i.e., as digital literacy increases, the positive effect of digital L&D on employee experience decreases. This suggests a negative moderating effect. The standard error is the representation of the precision of the regression coefficient and should ideally be small. In this case, all the SE values are less than 0.1, suggesting that the estimates are reliable. Critical ratio of more than 1.96 represent statistical significance of less than 0.05. P value represents the probability that the relationship tested has occurred by chance and must be less than 0.05. Here, all the hypotheses show p-value of less than 0.05, thus confirming the presence of the impact of digital L&D systems on employee experience and also confirming the presence of moderating effect of adaptability and digital literacy in this impact.

4. Discussion and implications

The first hypothesis explored the impact of digital L&D systems on employee experience. the confirmation of this hypothesis affirms the positive impact digital L&D systems have on employees' reflection of corporate values, and

their happiness and satisfaction from their job and place of work, culminating into their overall experience. Studies show that this employee experience boosts their overall engagement levels (Lemon, 2019; Turner, 2020), job satisfaction (Soni et al., 2017), and productivity (Hill, 2022). Our empirical results support this, showing that not only do digital systems convey knowledge but also create positive workplace experiences and feelings, thus establishing the relevance of digital systems for learning processes.

The second hypothesis tested the moderating effect of adaptability in the impact of digital L&D systems on employee experience. This hypothesis was also accepted, suggesting that adaptable employees experience better outcomes of digital systems. Existing studies also show adaptability as a critical enabler of employee experience (Van Der Schaft et al., 2024), and even technically well-executed changes can fail if employees perceive them as threatening their work identity or intrinsic motivations. This indicates the critical role of adaptability in positive employee experiences.

Interestingly, H3 results showed that digital literacy drives employee experiences negatively when digital L&D systems are involved, i.e., as DL increases, the positive relationship between digital L&D systems and EE decreases. This can be attributed to the fact that digitally literate individuals can self-navigate, explore and build content independently as well as anonymously (Huu, 2023; S. Lin & Overbaugh, 2013). It can also be inferred here that digital literacy leads to a less critical perception of digital systems, as employees can use technology independently to fulfil their learning needs.

The fourth and the fifth hypotheses show that adaptability and digital literacy are key individual traits enhancing engagement and satisfaction in digitally-motivated workplaces, in line with previous findings (Chuan & Lai, 2025; Martin et al., 2021). The acceptance of the moderating effect shows that employee experiences can be improved through greater efficiency, autonomy, and reduced technology anxiety, which leads to enhanced satisfaction and performance, driving to higher levels of engagement and overall experience in digital workplaces.

This study contributes to the discourse on digital learning and development systems by linking its application to the dimensions of adaptability and digital literacy in understanding how they affect employee experience. Most existing studies explore the direct effect of digital systems on employee experiences and engagement while discounting the moderating roles played by individual factors. Moreover, the negative moderating role played by digital literacy challenges the narrative that digital L&D systems always yield positive employee outcomes. This invites future academic investigation of the threshold effects of digital literacy to explore how digital competence can lead to degraded employee experiences. Further, this study also extends the discourse on the Theory of Planned Behaviour by exploring how adaptability and digital literacy act as PCB traits towards defining employees' experiences. These findings suggest that future researchers can explore additional dimensions such as employee engagement and employee satisfaction when it comes to digital L&D systems' effects. This study sets a precedent for the exploration of individual traits in digital settings and contributes to contemporary theories related to digital adoption at workplaces.

This study also has practical implications. It reaffirms the relevance of digital L&D systems such as AI-enabled tools, LMSes, AR, VR, gamification, online mentoring and tutoring to enhance employee experience. The finding that adaptability and digital literacy as individual traits do not always lead to positive outcomes must be considered while creating training programs by including adaptability-building modules like resilience and change-readiness to surpass basic system usage. Managers can even make use of the findings of this study during recruitment to ensure that the new recruits are aligned with their training programs. Lastly, employee engagement and satisfaction levels can receive a significant boost when organisations build supportive work environments which rewards self-learning and autonomous learning.

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