

The Effect of Digital Literacy and Training Employee Performance with Learning Agility as a Mediating Variable Among Employees of PT Lestari Jaya

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Keywords:	Abstract
digital literacy; training; learning agility; employee performance.	This study examines the effect of digital literacy and training on employee performance, mediated by learning agility, among engineers at PT Kubayan Lestari Jaya, an Indonesian information and communication technology company. Rapid digital transformation requires technical employees to continuously upgrade both digital competence and hands-on technical skill, yet a preliminary survey revealed uneven mastery of core engineering tasks among staff and mixed evidence from prior studies regarding the role of digital literacy and training. This research tests seven hypotheses linking digital literacy, training, learning agility, and employee performance through a Resource-Based View lens. a quantitative survey was administered to 88 engineers using total sampling, and data were analyzed with Structural Equation Modeling based on Partial Least Squares (SEM-PLS) using SmartPLS 4. Findings and digital literacy and training each significantly and positively affect employee performance and learning agility; learning agility significantly improves performance and partially mediates the effects of digital literacy and training on performance. Strengthening digital competence and structured, coaching-supported training, combined with deliberate development of learning agility, is recommended to sustainably improve employee performance in technology-based organizations.

INTRODUCTION

Digital transformation requires organizations to adapt quickly to technological change and market dynamics. Digital literacy has become a fundamental competency needed not only by individuals but also by organizations, as it determines a company's success in managing information, driving work efficiency, and creating sustainable innovation (Tang & Chaw, 2020). PT Kubayan Lestari Jaya, a provider of information and communication technology infrastructure solutions, is required to develop human resources with competencies aligned with the demands of the digital era (Nagel, 2020), given that companies able to integrate digital technology into their human resource management strategy have greater opportunities to achieve competitive advantage.

A preliminary survey of 88 engineers at PT Kubayan Lestari Jaya showed that the majority of employees hold bachelor's degrees in Electrical Engineering or Informatics Engineering, yet mastery of technical skills remains uneven: 39.7% of employees have mastered only basic tasks (device installation and migration), 25.0% have mastered power upgrades, and only 26.9% have mastered the full technical sequence from installation through device integration. This gap directly affects performance appraisal, compensation

schemes, and project bonus allocation, and also indicates issues with the effectiveness of existing training programs (Setiawan et al., 2023). Training is a strategic investment made by companies to improve employees' knowledge, skills, and work attitudes (Noe et al., 2017; Widodo, 2018; Blanchard & Thacker, 2020); however, its effectiveness heavily depends on individual capacity to absorb and adaptively apply new learning, namely learning agility.

Prior studies show inconsistent findings regarding the relationships among these variables. Digital literacy has been reported to positively affect employee performance (Sofía Emilce Belleza-Torrejón, 2024), yet other studies found no significant relationship (Putra et al., 2023). Learning agility has been reported to positively affect performance (Khildani et al., 2021), while the role of training in strengthening the effect of digital literacy on performance also shows contradictory results across studies (Ramadhan et al., 2023; Metriyadi & Panjaitan, 2024). This research gap underlies the need to re-examine these relationships in the context of an Indonesian information and communication technology company, positioning learning agility as a mediating variable between digital literacy, training, and employee performance — a novelty that specifically targets technical engineers, a worker group rarely studied in this context.

The novelty of this research lies in its examination of learning agility as a mediating variable between both digital literacy and training on employee performance within a single integrated model, specifically among technical engineers in an Indonesian information and communication technology company. Previous studies have typically examined these relationships separately or in different organizational contexts, but this study uniquely combines them and applies them to a population of field-based technical workers. The study also makes a methodological contribution by employing SEM-PLS for a comprehensive analysis of direct and indirect effects, providing more robust statistical evidence than traditional regression approaches. This integrated model, grounded in the Resource-Based View (RBV) framework, offers a more complete understanding of how individual and organizational resources interact to influence performance outcomes. The research also contributes to practice by identifying which dimensions of digital literacy and training are most influential, thereby providing actionable insights for organizational development.

This study also holds strategic relevance for the achievement of the Sustainable Development Goals (SDGs), particularly SDG 4 (Quality Education) through continuous improvement of digital literacy and training, and SDG 8 (Decent Work and Economic Growth) through improved productivity and work quality (Olawumi & Chan, 2018). Based on the foregoing, this article aims to examine and analyze the effect of digital literacy and training on employee performance, both directly and through the mediation of learning agility, among project-team employees of PT Kubayan Lestari Jaya.

METHOD

This study employs a quantitative approach using a survey method to statistically test the relationships among variables (Slater, 2024; Ogbonna, 2024). The population

consists of all project-team engineers at PT Kubayan Lestari Jaya, spread across several cities (Jakarta, Bandung, Bali, Surabaya, and Semarang), totaling 88 people. The sampling technique used is total sampling, whereby the entire population serves as the study's respondents (Sugiyono, 2020).

Data were collected through a closed-ended questionnaire using a 1-5 Likert scale (1 = strongly disagree to 5 = strongly agree), constructed based on the indicators of each variable: digital literacy (X1), training (X2), learning agility (Z), and employee performance (Y), as summarized in Table 1.

Table 1. Research Variables, Dimensions, and Measurement Sources

Variable	Dimensions	Source
Digital Literacy (X1)	Technology, Cognitive, Communication, Creativity	Mita et al. (2024); Rahmita (2024)
Training (X2)	Instructor, Participants, Materials, Objectives	Permitasari (2020)
Learning Agility (Z)	People, Result, Mental, Change Agility	Devi Jatmika & Puspitasari (2022)
Employee Performance (Y)	Quantity, Quality, Timeliness	Damanik (2021); Blanchard & Thacker (2020)

Data were analyzed using Structural Equation Modeling based on Partial Least Squares (SEM-PLS) with SmartPLS 4 software, as this method can analyze complex models with limited sample sizes and does not require normally distributed data (Hair et al., 2019). Outer (measurement) model evaluation included convergent validity (loading factor > 0.7 ; AVE > 0.5), discriminant validity, and reliability (Cronbach's Alpha and Composite Reliability > 0.7) (Hair et al., 2021; Chin, 1998). Inner (structural) model evaluation included a multicollinearity test (VIF < 10), the coefficient of determination (R^2), and hypothesis testing via bootstrapping at a 5% significance level (p -value < 0.05 ; t -statistic > 1.96) (Hair et al., 2019; Ghozali & Latan, 2015).

RESULTS AND DISCUSSION

Respondent Characteristics

The study involved 88 engineer respondents from PT Kubayan Lestari Jaya. Respondent profiles are summarized in Table 2.

Table 2. Characteristics of Research Respondents

Characteristic	Category	Frequency	%
Age	20-29 years	44	50.00
	30-39 years	38	43.18
	40-49 years	5	5.68
	>49 years	1	1.14
Education	Vocational HS	46	52.27

Characteristic	Category	Frequency	%
Division	Diploma 3	25	28.41
	Diploma 4	4	4.55
	Bachelor's	13	14.77
	Project	55	62.50
	Sales & HR	33	37.50
Educational background	Electrical Engineering	45	51.14
	Informatics Engineering	43	48.86
	Device migration	33	37.50
	Device installation	22	25.00
	Power upgrade	22	25.00
Specialization	Device integration	11	12.50
	Jakarta	36	40.91
	Bandung	33	37.50
	Bali	14	15.91
	Surabaya	4	4.55
Work location	Semarang	1	1.14

Descriptive Statistics

Descriptive analysis of all variable indicators shows consistent mean values in the range of 4.23-4.55 with standard deviations of 0.52-0.73, indicating high to very high respondent perceptions of digital literacy, training, learning agility, and employee performance. All indicators show negative skewness (data clustered toward high scores), and the Cramér-von Mises test produced $p < 0.05$ for all indicators, indicating that the data are not normally distributed — a condition consistent with the underlying assumption of SEM-PLS, which does not require multivariate normality.

Outer Model Evaluation

Convergent validity testing shows that all outer loading values for indicators of Employee Performance (0.804-0.961), Learning Agility (0.829-0.955), Digital Literacy (0.818-0.956), and Training (0.835-0.879) exceed the 0.7 threshold, so all indicators are declared valid. The reliability test results in Table 5 show that all constructs have Cronbach's Alpha and Composite Reliability values above 0.7, so the research instrument is declared reliable.

Table 3. Construct Reliability Test Results

Variable	Cronbach's Alpha	Composite Reliability (rho_a)	Composite Reliability (rho_c)
Employee Performance	0.828	0.840	0.896
Learning Agility	0.944	0.823	0.969

Variable	Cronbach's Alpha	Composite Reliability (rho_a)	Composite Reliability (rho_c)
Digital Literacy	0.876	0.867	0.820
Training	0.909	0.946	0.854

Discriminant Validity (HTMT)

Discriminant validity assesses the extent to which a construct differs significantly from other constructs in the model. Testing was conducted using the Heterotrait-Monotrait Ratio (HTMT) criterion, where an HTMT value < 0.90 indicates good discriminant validity (Hair et al., 2019). The results are presented in Table 4a.

Table 4 Discriminant Validity Results Using the Heterotrait-Monotrait Ratio (HTMT)

Construct	Employee Performance	Learning Agility	Digital Literacy	Training
Employee Performance	-			
Learning Agility	0.864	-		
Digital Literacy	0.687	0.697	-	
Training	0.901	0.731	0.751	-

Most construct pairs show HTMT values below 0.90, thereby satisfying the discriminant validity criterion. One construct pair, Training and Employee Performance, shows an HTMT value of 0.901 — very close to the 0.900 threshold, with a difference of only 0.001. This value indicates a relatively high conceptual closeness between the two constructs, given that effective training is, in practice, often perceived by respondents as aligned with the performance improvement they experience. Nevertheless, both constructs are retained in the model because they are theoretically distinct: training is a process of enhancing knowledge and skills (an input), whereas employee performance is the work outcome achieved (an output). All other construct pairs fully satisfy the HTMT criterion, so the measurement model as a whole is declared valid and suitable for proceeding to structural (inner) model evaluation.

Inner Model Evaluation

The multicollinearity test shows that all Variance Inflation Factor (VIF) values range from 1.037 to 1.576, well below the threshold of 10, indicating no multicollinearity among indicators. The R-Square values in Table 6 show a moderate category for both endogenous variables. Table 5.

Table 5. R-Square and Adjusted R-Square Results

Variable	R-Square	R-Square Adjusted
Employee Performance	0.291	0.266
Learning Agility	0.281	0.264

Digital literacy and training together explain 29.1% of the variance in employee performance, while digital literacy and training explain 28.1% of the variance in learning agility; the remainder is explained by other variables outside this research model.

Hypothesis Testing

Hypothesis testing was conducted through a bootstrapping procedure at a 5% significance level. The results of direct and indirect effect testing are presented in Table 6.

Table 6. Hypothesis Testing Results for Direct and Indirect Effects

Hypothesis	Path	Coef. (O)	T-statistic	P-value	Result
H1	DL → EP	0.137	2.713	0.036	Supported
H2	TR → EP	0.419	2.151	0.032	Supported
H3	DL → LA	0.278	3.618	0.006	Supported
H4	TR → LA	0.366	3.150	0.032	Supported
H5	LA → EP	0.281	2.288	0.047	Supported
H6	DL → LA → EP	0.078	5.806	0.042	Supported
H7	TR → LA → EP	0.103	3.085	0.028	Supported

All seven research hypotheses are supported, as the p-values for all paths are below 0.05. Digital literacy and training both directly improve employee performance, with training showing a relatively stronger effect (coefficient 0.419) than digital literacy (coefficient 0.137). Both exogenous variables were also shown to improve learning agility, which in turn positively affects employee performance (coefficient 0.281) and partially mediates the effects of digital literacy and training on performance.

Discussion

The following discussion addresses the results of testing the seven hypotheses in sequence, linking them to Resource-Based View (RBV) theory and relevant prior research.

Effect of Digital Literacy on Employee Performance

The test results show that digital literacy has a positive and significant effect on employee performance (coefficient 0.137; $p = 0.036$). This finding is consistent with the RBV view that digital competence is a valuable and rare strategic resource in the digital transformation era (Barney, 1991; Akter et al., 2022), and aligns with evidence that digital literacy supports work efficiency and productivity (Park & Jo, 2021; Widodo & Prasetyo, 2020). Employees who can critically access, evaluate, and apply digital technology tend to complete data-driven and digitally reported tasks more quickly, thereby improving their performance (Nasution & Panggabean, 2021). This finding reinforces studies reporting a similar positive relationship (Sofía Emilce Belleza-Torrejón, 2024), although it differs from studies reporting a non-significant relationship in other organizational contexts (Putra et al., 2023). This discrepancy is likely due to differences in job context: among the technical engineer population at PT Kubayan Lestari Jaya, digital literacy is a

direct prerequisite for using work tools and project reporting systems, whereas among non-technical populations its effect tends to be more indirect.

Effect of Training on Employee Performance

Training is shown to have a positive and significant effect on employee performance, with a path coefficient (0.419) far greater than that of digital literacy, making it the most dominant predictor of performance in this model. This result confirms that in field-based technical work such as installation, migration, upgrading, and device integration, the transfer of practical skills through structured training has a more direct and measurable impact than digital literacy alone (Widodo, 2018; Blanchard & Thacker, 2020). Employees who receive training relevant to their job needs demonstrate better procedural understanding, higher confidence, and are able to complete end-to-end tasks more efficiently. This finding is consistent with Zein (2025) and Mekdad (2025), who emphasize the importance of training as part of organizational capacity building, and is relevant to this study's initial finding that engineers who have completed comprehensive technical training complete work faster than those who have not been trained.

Effect of Digital Literacy on Learning Agility

Digital literacy is also shown to have a positive and significant effect on learning agility (coefficient 0.278; $p = 0.006$). Good digital literacy encompasses not only the ability to operate devices and applications but also the ability to critically assess information and solve problems using technology, making it easier for employees to explore new learning resources and adapt to change (Murthy & Thomas, 2021; Tang & Choi, 2020; Ifenthaler & Yau, 2019; Al-Qaysi & Al-Emran, 2022). At PT Kubayan Lestari Jaya, the use of online learning platforms and digital work applications encourages employees to be more proactive in developing new skills and to adapt more quickly to changes in work procedures and technology.

Effect of Training on Learning Agility

Training is shown to have a positive and significant effect on learning agility (coefficient 0.366; $p = 0.032$), making it the strongest predictor of learning agility in the model. Structured training focused on developing new skills and creative problem-solving encourages employees to be more flexible in facing work challenges, consistent with Lombardo and Eichinger (2000) and De Meuse, Dai, and Hallenbeck (2010), who assert that training based on experiential learning and mentoring improves employees' adaptive learning ability. The technical and soft-skill training programs implemented at PT Kubayan Lestari Jaya are believed to foster initiative and readiness among employees to face new, complex tasks, thereby significantly improving their learning agility.

Effect of Learning Agility on Employee Performance

Learning agility is shown to have a positive and significant effect on employee performance (coefficient 0.281; $p = 0.047$). Employees with high learning agility are able to quickly understand new situations, identify effective solutions, and take initiative in facing work challenges, directly impacting productivity and work quality (De Meuse & Dai, 2020; Zenger & Folkman, 2021; Carter & Kumar, 2020). This finding is consistent with De Meuse, Dai, and Hallenbeck (2010) and Lombardo and Eichinger (2000), who

position learning agility as a key factor in individual performance within dynamic and competitive work environments such as the information technology infrastructure industry.

Mediating Role of Learning Agility between Digital Literacy and Employee Performance

Indirect effect testing shows that learning agility significantly mediates the effect of digital literacy on employee performance (coefficient 0.078; $p = 0.042$). This result confirms that digital literacy alone is insufficient to optimally improve performance without being supported by sustained learning and adaptation capacity (Chong & Zainal, 2024; Gandomi & Haider, 2015). In other words, employees with high digital literacy will gain greater performance benefits if they are also able to learn quickly and adaptively apply that digital knowledge in their daily work — a mechanism consistent with the RBV view that the value of a resource (digital literacy) is determined by the dynamic capability of the organization and the individual in managing it (Teece et al., 1997).

Mediating Role of Learning Agility between Training and Employee Performance

Learning agility is also shown to significantly mediate the effect of training on employee performance (coefficient 0.103; $p = 0.028$). This finding reinforces Widiyanto's (2022) argument that training effectiveness is optimized when participants possess high learning readiness and flexibility, such that the effect of training on performance is not only direct but also strengthened through employees' adaptive learning ability. Overall, the results of testing all seven hypotheses provide coherent empirical support for the RBV framework: individual performance advantage at PT Kubayan Lestari Jaya depends not only on the availability of digital literacy and training as resources, but also on employees' internal capacity to process and adaptively apply those resources through learning agility.

CONCLUSION

This study concludes that digital literacy and training each have a positive and significant effect on employee performance and on learning agility; learning agility itself has a positive and significant effect on employee performance and significantly mediates the effects of digital literacy and training on the performance of engineers at PT Kubayan Lestari Jaya. Technology mastery emerges as the dominant dimension of digital literacy, while practical skill mastery emerges as the dominant dimension of training; both findings confirm that simultaneously improving digital and technical competence can drive higher performance.

Managerially, PT Kubayan Lestari Jaya is advised to: (1) strengthen digital literacy programs that include awareness of digital security and ethics; (2) design more structured technical training with post-training coaching mechanisms and periodic evaluation; and (3) develop employees' learning agility through mentoring, job rotation, and cross-functional projects, while also incorporating learning agility as an indicator in performance appraisal and succession planning. Future research is encouraged to broaden the sample to similar companies or subsidiaries, combine quantitative with qualitative

approaches, and consider additional variables relevant to employee performance in the information and communication technology industry.

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