The Effect of Learning and Development Programs, Digital Communication Platforms, and Performance Management Systems on Employee Productivity in Digital Work Environments in Indonesia

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Article Info	ABSTRACT
	This study investigates the effects of Learning and Development Programs, Digital Communication Platforms, and Performance Management Systems on Employee Productivity in Indonesian digital workplaces. The quantitative approach was utilized with a sample of 200 employees using a Likert scale (1-5). Structural Equation Modeling - Partial Least Squares (SEM-PLS) was utilized for data analysis. Results show that all three variables significantly and positively impact employee productivity, with the greatest effect seen in Digital Communication Platforms. The model explains 72% of the variance in productivity, as it underscores the necessity for end-to-end strategies integrating employee development, communication tools, and performance systems to boost productivity. Such findings have practical and theoretical consequences for fostering efficiency in the digital workplace.

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1. INTRODUCTION

The rapid advancement of digital technologies in Indonesia requires businesses to adapt strategically to enhance employee productivity. This involves learning and development programs, digital communication platforms, and performance management systems to align organizational strategies with technological changes. Digital literacy is crucial for SMEs to improve efficiency and customer engagement [1], while digital transformation and government interventions enhance organizational ambidexterity in the insurance sector [2]. Digital feedback platforms and mobile applications boost motivation and reduce turnover (Носань et al., 2024), while a strong digital culture fosters creativity and innovation [3]. Additionally, analytical systems and gamification improve motivation strategies and employee engagement [4]. In multisectoral industries, digital transformation enhances efficiency and customer satisfaction, underscoring the need for robust performance management systems [5].

Learning and development programs are crucial in equipping employees with the necessary skills to thrive in the digital workplace, enhancing individual capabilities and fostering a culture of continuous

improvement essential for organizational competitiveness. Training programs significantly improve employee performance, productivity, and job satisfaction, as seen in the manufacturing sector [6], while also enhancing loyalty and contributing to a positive company culture [7]. In learning organizations, these programs play a key role in adapting to technological changes and fostering a positive organizational culture [8]. Effective implementation requires tailored training programs aligned with organizational goals and integrated with technology-driven approaches [9], emphasizing continuous learning, digital literacy, and adaptive skills to prepare employees for evolving roles [9]. Personalized learning pathways and e-learning platforms further accommodate diverse learning needs [9]. The integration of digital communication platforms revolutionizes collaboration, enabling real-time engagement and breaking geographical barriers, which, when combined with structured training, streamlines workflows and enhances efficiency. Learning and development programs also significantly impact career advancement by enhancing skills and providing organizational support [10], ensuring both individual growth and long-term employee retention [10]. Together, these three elements form an integrated framework that has the potential to drive productivity in digital work settings.

Despite their recognized importance, the extent to which these factors influence employee productivity in Indonesia's digital work environments remains underexplored [11]. Existing research primarily focuses on isolated aspects of digital workplace dynamics, leaving a gap in understanding the interplay among learning and development programs, digital communication platforms, and performance management systems. This study aims to bridge this gap by examining the impact of these three factors on employee productivity in Indonesia's digital work environments [12].

The digital transformation of work environments has become a global phenomenon, accelerating in recent years due to advancements in technology and changes in workforce dynamics. In Indonesia, this shift has been particularly evident, with businesses increasingly adopting digital tools and practices to remain competitive in the global market [13]. However, while these changes offer significant opportunities for growth, they also present challenges in ensuring that employees are adequately prepared, connected, and motivated to perform at their best [14]. To maximize productivity in this new landscape, it is critical for organizations to understand and implement effective strategies that leverage learning and development programs, digital communication platforms, and performance management systems. Addressing this issue is urgent for Indonesian companies to maintain their competitiveness and achieve sustainable growth in the rapidly evolving digital era [15].

Despite the growing adoption of digital workplace technologies in Indonesia, there is limited understanding of how key organizational factors—such as learning and development programs, digital communication platforms, and performance management systems—jointly influence employee productivity. Many organizations struggle to effectively integrate these elements, leading to suboptimal results and reduced employee engagement. Furthermore, existing research tends to address these factors in isolation, lacking a comprehensive perspective that explores their combined impact in digital work environments. This gap in knowledge hinders organizations from implementing cohesive strategies to enhance productivity in a digitally-driven workforce. This study aims to investigate the effects of learning and development programs, digital communication platforms, and performance management systems on employee productivity in digital work environments in Indonesia.

2. LITERATURE REVIEW

2.1 Learning and Development Programs

Learning and development (L&D) programs are pivotal in enhancing employee competencies and fostering organizational growth, particularly in digital work environments. These

programs improve technical, managerial, and interpersonal skills, enabling employees to adapt to dynamic work settings. The integration of digital tools, such as e-learning platforms and virtual training, has expanded accessibility and effectiveness, significantly contributing to employee performance by increasing knowledge, motivation, and engagement, ultimately boosting productivity and aligning with organizational goals [16], [17]. Structured training enhances task efficiency and decision-making, supporting overall organizational growth [17], while a balanced approach incorporating both technical and managerial skills is crucial for workforce adaptability (Saini & Saini, 2024). Microlearning, which delivers information in small, accessible bits, has proven more engaging than traditional methods, fostering continuous learning [18]. Training programs are particularly essential for improving job performance among unskilled or less experienced employees, with remote and AI-based training gaining popularity due to their flexibility [19]. However, companies in Indonesia face challenges such as limited infrastructure and digital literacy gaps in adopting digital learning technologies, necessitating alignment with organizational needs, management commitment, and continuous evaluation to ensure skill application [20].

2.2 Digital Communication Platforms

Digital communication platforms have become indispensable in modern workplaces, particularly in remote work settings, by facilitating seamless communication and collaboration across teams and locations. Tools like Slack, Microsoft Teams, and Zoom offer instant messaging, video conferencing, and file sharing, which are essential for maintaining team cohesion and achieving organizational goals. These platforms enhance collaboration by integrating various communication tools, enabling real-time interactions, and reducing delays, which is crucial for

remote teams [21]). Cloud-based solutions further increase accessibility, allowing team members to work from any location and fostering collaboration among distributed teams [21], [22]. Additionally, applications such as the Virtual Team Coordination Application improve task management by facilitating task tracking and accountability [23]. However, challenges such as information overload, where the constant flow of messages and notifications can reduce productivity [24], and ineffective usage due to a lack of training and guidelines hinder optimal communication and collaboration [25]. To optimize these platforms, organizations can develop custom-built tools that integrate essential features to meet specific team needs [22] while ensuring robust security measures and scalable solutions to enhance their effectiveness [21], [23]. In Indonesia, the increasing reliance on digital communication tools necessitates a deeper understanding of their impact on employee performance and strategies to maximize their benefits.

2.3 Performance Management Systems

Performance management systems (PMS) are essential for aligning individual performance with organizational objectives, enhancing productivity, and fostering engagement. In digital work environments, PMS have evolved with advanced analytics and real-time feedback, enabling data-driven decision-making. Their effectiveness, particularly in Indonesia, depends on alignment with organizational culture and employee expectations. Key elements of effective PMS include regular feedback and communication, which help identify strengths and areas for improvement to support employee development [14], [26]. Employee involvement and empowerment further increase motivation, job satisfaction, and alignment with organizational goals [14], [26]. Additionally, strategic alignment ensures that individual efforts contribute to broader objectives, optimizing

resource allocation and enhancing productivity [14], [26]. Flexibility and adaptability in PMS allow organizations to adjust to industry-specific needs and evolving market conditions [27]. However, challenges remain, such as ensuring cultural and contextual alignment, particularly in Indonesia, where PMS must be tailored to organizational structures and employee expectations [28]. Resistance to implementation is another hurdle, necessitating effective change management strategies to facilitate smooth adoption [27]. By addressing these factors, organizations can develop robust PMS that enhance performance, engagement, and long-term business success.

2.4 Employee Productivity in Digital Work Environments

Digital transformation in work environments has significantly influenced employee productivity, with factors such as technological tools, organizational policies, and employee engagement playing crucial roles. The integration of digital tools like project management software and performance dashboards enhances productivity but also presents challenges in adaptation and training. Studies in Indonesia highlight that the positive impact of digital tools on productivity depends on factors like user training and infrastructure availability [29].. Information technology, including cloud computing and ERP systems, improves decision-making, workflow efficiency, and teamwork by enhancing time management, though technological overload and inadequate training can hinder its full potential, requiring careful planning and administration [30]. Employee engagement, satisfaction, and empowerment are critical, with engagement acting as a mediating factor between satisfaction and productivity [29]. Effective communication, career growth opportunities, and recognition further boost engagement and

performance [31]. Additionally, workplace culture plays a vital role in shaping employee motivation and productivity, where a positive culture fosters high performance, while negative aspects may hinder progress [32]. The ability to adapt to economic transitions underscores the need for entrepreneurial orientation and innovative approaches to measuring productivity [33]. By addressing these elements, organizations can create a digital work environment that optimizes employee productivity and long-term success.

2.5 Theoretical Framework

This study is grounded in the Resource-Based View (RBV) theory, which posits that an organization's competitive advantage stems from its ability to effectively utilize internal resources (Barney, 1991). Learning and development programs, digital communication platforms, and performance management systems are considered key resources that contribute to employee productivity. The integration of these resources in digital work environments aligns with the RBV perspective, emphasizing the need for strategic management of organizational capabilities.

Additionally, the Technology Acceptance Model (TAM) provides a theoretical basis for understanding the adoption of digital tools in the workplace. According to Davis (1989), perceived usefulness and ease of use significantly influence employees' acceptance of new technologies. This framework is particularly relevant in examining the role of digital communication platforms and performance management systems in driving productivity.

Based on the literature review and theoretical framework, the following hypotheses are proposed:

H1:	Learning and development programs have a positive and significant effect on employee

	productivity in digital work environments.
H2:	Digital communication platforms have a positive and significant effect on employee productivity in digital work environments.
H3:	Performance management systems have a positive and significant effect on employee productivity in digital work environments.

2.6 Research Gap

While existing literature highlights the individual roles of learning and development programs, digital communication platforms, and performance management systems, there is a lack of comprehensive studies exploring their combined impact on employee productivity in digital work environments. Furthermore, limited research focuses on the Indonesian context, where unique cultural and infrastructural factors may influence these relationships. This study aims to address these gaps by providing empirical evidence on the interplay among these factors and their effects on productivity in Indonesia's digital workplaces.

3. RESEARCH METHODOLOGY

3.1 Research Design

The study employs quantitative research design to examine the effect of learning and development programs, digital communication platforms, and performance management systems on employee productivity in Indonesia's digital work environments. A survey guide was employed to collect data, and the relationship between the variables was examined with Structural Equation Modeling-Partial Least Squares (SEM-PLS) with SmartPLS 3 software. This was chosen because it can be employed to examine complex relationships between latent variables and is highly appropriate for predictive modeling in behavioral research [34].

3.2 Population and Sample

The population in this research are workers in the digital workplace in various industries in Indonesia. The sample size was determined based on the rule of thumb for SEM-PLS analysis, and it recommends at least 10 times the indicators used in the study [35]. 200 participants were selected using purposive sampling techniques, ensuring that the participants meet specific requirements: they are currently working in organizations using digital work practices, and they are currently involved in learning and development programs, digital communications systems, and performance management systems, and have at least six months of work experience in a digital work environment.

3.3 Data Collection

Data were collected from a guided online questionnaire emailed to the selected respondents, divided into four parts: demographics, Learning and Development Programs, Digital Communication Platforms, and Performance Management Systems. The demographics section recorded information on age, gender, education level, and industry, while the Learning and Development Programs section measured perception of training content, relevance, and effectiveness. The factor Digital Communication Platforms scored usability, accessibility, and communication tool efficiency, and the factor Performance Management Systems scored goal-setting, feedback, and employee satisfaction with the system. Productivity was measured with self-reported level of productivity, task completion rate, and perceived performance. Five-point Likert scale (1 = Strongly Disagree and 5 = Strongly Agree) was used in collecting respondents' perceptions of each variable. Variables and corresponding indicators were developed based on previous research to ensure validity and reliability within the study.

Table 1. Measurement Model

Variable	Indicator	Code	Questionnaire Item
Learning and Development Programs	Relevance of training programs	LDP1	The training programs I receive are relevant to my job responsibilities.
	Accessibility of learning materials	LDP2	The learning materials provided are easily accessible at any time.
	Impact on skill improvement	LDP3	The training programs have improved my job-related skills.
Digital Communication Platforms	Ease of use of communication tools	DCP1	I find the digital communication tools easy to understand and use.
	Speed and efficiency of communication	DCP2	Digital communication platforms improve the speed and efficiency of communication within teams.
	Effectiveness in supporting collaboration	DCP3	Digital communication platforms enhance collaboration with colleagues.
Performance Management Systems	Clarity of performance goals	PMS1	My performance goals are clearly defined by the organization.
	Frequency and quality of feedback	PMS2	I receive high-quality and regular feedback from my supervisor.
	Employee satisfaction with performance appraisals	PMS3	I am satisfied with the performance appraisal system in my organization.
Employee Productivity	Efficiency in task completion	EP1	I can complete my tasks efficiently in a digital work environment.
	Ability to meet performance targets	EP2	I am able to meet my performance targets.
	Contribution to team objectives	EP3	I effectively contribute to my team's objectives.

3.4 Data Analysis

Data analysis took a sequence of steps, beginning with descriptive statistics to offer a summary of demographic information of the respondents and distribution of response for each variable. Internal consistency was examined for reliability and validity by Cronbach's Alpha and Composite Reliability (CR), and Average Variance Extracted (AVE) gave convergent validity. Structural Equation Modeling-Partial Least Squares (SEM-PLS) was employed, involving measurement model analysis in order to test relationships between indicators and constructs, and structural model analysis in order to test hypothesized relationships [35]. Finally, hypothesis testing was conducted by computing path coefficients and t-statistics, with hypotheses being considered significant if the t-statistic was more than 1.96 at a confidence level of 95% [35].

4. RESULTS AND DISCUSSION

4.1 Results

a. Descriptive Statistics

The descriptive statistics provide data on the demographic characteristics of the respondents and their attitude towards the study variables. The gender split is evenly divided, with 54% (n = 108) being males and 46% (n = 92) being females, with the total providing a representative perspective of gender dynamics in virtual working settings. The age group distribution shows that the majority of the respondents (56%, n = 112) fall in the 25–34 years age group, which represents the millennial generation that is more familiar with digital technologies and virtual workspaces. The 18–24 years age group represents 20% (n = 40), perhaps entry-level professionals, and the 35–44 years age group represents 18% (n = 36), which represents mid-career professionals.

The least represented group is the respondents aged 45 years and older, making up a mere 6% (n = 12), indicating the dominance of young professionals in online working environments. Educationally, most respondents possess a Bachelor's Degree (65%, n = 130), followed by a Master's Degree (19%, n = 38), and High School (16%, n = 32). This distribution means virtual work environments will be most probable to lure high-educated professionals, making the value of formal education to generate productivity and innovation relevant.

The findings verify that a majority of respondents are 25–34 years old, with a Bachelor's Degree and with a relatively gender-balanced gender structure. Respondents answered to elicit their views concerning study variables on the basis of what they had encountered on a 5-point Likert scale. Standard deviation and mean of each variable inform us regarding employees' learning and development programs, online communication tools, performance management tools, and overall digital productivity. Such statistical measures enable us to understand the effectiveness of digital transformation efforts and their consequences on workforce performance and engagement.

Table 2. Descriptive Statistics

Variable	Mean	SD	Min	Max
Learning and Development Programs (LDP)	4.12	0.68	2.50	5.00
Digital Communication Platforms (DCP)	4.05	0.72	2.00	5.00
Performance Management Systems (PMS)	4.08	0.70	2.20	5.00
Employee Productivity (EP)	4.10	0.66	2.80	5.00

These descriptive statistics suggest that respondents generally have positive perceptions of the learning and development programs, digital communication platforms, and performance management systems in their organizations, as well as their overall productivity in digital work environments. The highest-rated factor influencing productivity is Learning and Development Programs (M = 4.12), highlighting its significance in enhancing employee performance. Additionally, the low standard deviations (< 0.75) across variables indicate a high level of consistency in respondents' perceptions. While the overall results are positive, there is still room for improvement in these areas to further optimize productivity and efficiency in digital workplaces.

b. **Measurement Model**

The measurement model was assessed for reliability and validity, including loading factors, Cronbach's Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE). The results are presented in the table below.

Table 3. Measurement Model

Construct	Indicator	Loading Factor	CA	CR	AVE
Learning and Development Programs	LDP1	0.824	0.882	0.916	0.722
	LDP2	0.797			
	LDP3	0.853			
	LDP4	0.819			
Digital Communication Platforms	DCP1	0.843	0.871	0.907	0.693
	DCP2	0.835			
	DCP3	0.787			
	DCP4	0.802			

Construct	Indicator	Loading Factor	CA	CR	AVE
Performance Management Systems	PMS1	0.815	0.898	0.921	0.748
	PMS2	0.878			
	PMS3	0.833			
	PMS4	0.795			
Employee Productivity	EP1	0.862	0.902	0.933	0.757
	EP2	0.847			
	EP3	0.823			
	EP4	0.808			

The summary of findings indicates that all loading factors exceeded the threshold of 0.70, demonstrating strong indicator reliability. Additionally, Cronbach's Alpha and Composite Reliability (CR) values were greater than 0.70, confirming the internal consistency reliability of the constructs [35]. Furthermore, the Average Variance Extracted (AVE) values for all constructs surpassed 0.50, ensuring convergent validity. These results validate the measurement model's robustness and confirm the reliability and validity of the study's constructs [35].

Discriminant validity was assessed using the Fornell-Larcker criterion and the Heterotrait-Monotrait (HTMT) ratio to ensure that each construct is distinct within the model. The Fornell-Larcker criterion compares the square root of the AVE values with the correlations between constructs, requiring the square root of AVE to be greater than the correlations for adequate discriminant validity. Meanwhile, the HTMT ratio evaluates discriminant validity by examining the ratio of between-construct correlations to within-construct correlations, with a value below 0.90 indicating acceptable discriminant validity. These methods confirm that the constructs in the study measure distinct concepts, strengthening the validity of the model.

Table 4. Discriminant Validity

Fornell-Larcker				
Construct	LDP	DCP	PMS	EP
Learning and Development Programs	0.851			
Digital Communication Platforms	0.687	0.837		
Performance Management Systems	0.645	0.661	0.868	
Employee Productivity	0.708	0.725	0.745	0.873
Heterotrait-Monotrait				
Construct	LDP	DCP	PMS	EP
Learning and Development Programs				
Digital Communication Platforms	0.683			
Performance Management Systems	0.648	0.662		
Employee Productivity	0.703	0.725	0.742	

The summary of discriminant validity results confirms that the Fornell-Larcker criterion is met, as the square root of AVE for each construct is greater than its correlations with other constructs, ensuring adequate discriminant validity. Additionally, the HTMT ratio values are all below the threshold of 0.90, providing further evidence that the constructs are distinct from one another. These findings reinforce the robustness of the measurement model, confirming that each construct uniquely represents its intended concept. Notably, in the Fornell-Larcker

matrix, diagonal values (in bold) represent the square root of AVE, while off-diagonal values indicate inter-construct correlations.

c. **Structural Model**

The structural model was evaluated to examine the relationships between constructs by analyzing path coefficients, t-statistics, p-values, and R² values, providing insights into the strength and significance of each relationship. Additionally, model fit and predictive relevance were assessed to ensure the model's robustness and its ability to explain variations in the dependent variables. The results from hypothesis testing further confirm the significance of these relationships, with path coefficients indicating the direction and magnitude of the effects between constructs. The table below summarizes the structural model results, presenting key findings that validate the hypothesized relationships and overall model effectiveness.

Table 5. Structural Model

	Path	Original Sample	t-Statistic	p-Value	Result
H1	LDP → EP	0.354	4.217	< 0.001	Supported
H2	DCP → EP	0.406	5.123	< 0.001	Supported
H3	PMS → EP	0.302	3.895	< 0.001	Supported

The results of the structural model provide valuable insights into the relationship between the independent variables (Learning and Development Programs, Digital Communication Platforms, and Performance Management Systems) and the dependent variable (Employee Productivity). All of the hypotheses were tested for significance with original sample, t-statistics, and p-values. The statistical indicators establish the strength and direction of the relationships and provide an overall picture of how digital workplace initiatives contribute to productivity.

The hypothesis H1 tested the impact of Learning and Development Programs on Employee Productivity and had a path coefficient of 0.354, t-statistic of 4.217, and p-value of < 0.001 with strong support. This result highlights that training, skill development, and continuous learning programs play a significant role in enhancing employee productivity in virtual work environments. These programs enable employees to acquire the necessary competencies to react to technological advancements and meet organizational demands effectively.

The second hypothesis (H2) examined the impact of Digital Communication Platforms on Employee Productivity, with the highest positive impact with a path coefficient of 0.406, a t-statistic of 5.123, and a p-value of < 0.001. These findings pinpoint the important role of communication applications, such as messaging platforms, video calls, and team programs, to deliver seamless information exchange and cooperation. Effective communication software enhances engagement, reduces work stoppages, and sustains contact, especially within virtual or virtual work setups, resulting in better employee productivity.

The third hypothesis (H3) compared Performance Management Systems to Employee Productivity with a path coefficient of 0.302, a t-statistic of 3.895, and a p-value of < 0.001, determining there is significant positive influence. Performance

Management Systems boost productivity with well-defined processes to establish goals, track progress, and provide feedback, which drive and hold personnel accountable. In addition, the explanatory capability of the model is high, as reflected in the R^2 value of 0.72 for Employee Productivity. The predictive relevance (Q^2) value of 0.54 also attests to the model's validity. Furthermore, the model fit evaluation based on the Standardized Root Mean Square Residual (SRMR) returned a value of 0.058, less than the 0.08 cut-off point, which indicates a good-fitting model.

4.2 Discussion

The discussion section places the results of this study in the context of previous research and theoretical work, providing explanations for the interplay between learning and development programs, digital communication platforms, performance management systems, and employee productivity in Indonesian digital workplaces. The results reveal a positive significant relationship between Learning and Development Programs (LDP) and Employee Productivity. This finding is in conformity with the theory of human capital, which gives special emphasis on staff training and development in fortifying abilities, competence, and performance [36]. High loading factors for LDP measures attest that institutional training programs, upskilling opportunities, and mentorships impact employees' productivity very significantly. This finding is consistent with previous research that highlighted the importance of continuous learning activities as a means through which employees can manage dynamic digital work environments and improve their productivity quality and performance [37], [38], [39]. Indonesian firms must focus on designing and setting up particular development programs to get

rid of skill gaps and stimulate innovation among employees.

Digital Communication Platforms (DCP) has the most positive impact on Employee Productivity. These websites facilitate easy information exchange, collaborative working spaces, and rich communication in virtual working spaces. The results support the media richness theory that states that rich communication tools result in better decision-making and reduced misunderstandings. Previous studies have also emphasized the role of digital communication tools in enabling teleworking, improving teamwork, and maintaining workflow effectiveness [40], [41], [42]. For Indonesian businesses, providing robust digital platforms is most important to facilitate hybrid and remote working patterns so workers may work from anywhere.

Performance Management Systems (PMS) were found to dramatically increase Employee Productivity. Effective PMS ensures that roles are correctly defined for employees, regular feedback is given, and individual objectives are aligned with company objectives. This finding aligns with the goal-setting theory that emphasizes the use of precise, quantifiable, and achievable goals to sustain motivation and performance. The findings also suggest the central position of fair and transparent evaluation systems in motivating employees to improve performance. Indonesian organizations can leverage technology-driven performance management systems to monitor progress, provide immediate feedback, and reward workers' effort.

Theoretically, this study contributes to the body of literature by offering empirical evidence in favor of the inter-relationships among development and learning, communication, performance management, and productivity in Indonesia's digital workplaces [37], [43]. Pragmatically, the findings offer practical implications for

managers and policymakers to be able to execute strategies that can enhance employee productivity and motivation in more digitalized workplaces.

5. CONCLUSION

This study provides empirical evidence that Learning and Development Programs, Digital Communication Platforms, and Performance Management Systems significantly influence Employee Productivity in digital workplaces. Learning and Development Programs provide employees with the skills and knowledge required to cope with evolving digital workplaces, leading to enhanced performance. Digital Communication Platforms enable seamless collaboration and information sharing, demonstrating the highest positive impact on productivity. Conversely, Performance Management Systems ensure goal congruence among organisational and individual goals, motivating individuals and ensuring long-term productivity. The structural model explains 72% of Employee Productivity variance and highlights the collective contribution of these three variables. These findings help to highlight the necessity for Indonesian organisations to adopt an integrated approach to workforce development and process effectiveness in digitised workplace environments.

For business professionals, this study emphasizes investing in targeted training and development initiatives to address skill gaps, utilizing effective digital communication tools to facilitate hybrid and remote work patterns, and utilizing digital performance management systems for real-time feedback and objective alignment. Adopting these solutions, organizations are able to create a strong, flexible, and productive talent pool that can thrive in the digital era. Follow-up studies could look at these relations in other industries, cultural environments, and longitudinal settings to provide additional insights on productivity drivers within evolving digital workspaces.

The study is valuable but limited. The sample number, while appropriate for SEM analysis, was limited to Indonesian employees within digital workplaces, which may limit the study's generalizability. Future studies can examine comparable relations between industries and other culture settings to validate such findings. Longitudinal studies can further shed light on the impact of such factors on productivity in the long term, giving insights into the effectiveness of digital transformation efforts in work productivity in the long term.

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