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Education, Work Ability, and Job Stress as Determinants of Employee Productivity in Jakarta's MSMEs

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Article History



Abstract

This study investigates the determinants of employee productivity in Jakarta's Micro, Small, and Medium Enterprises (MSMEs), focusing on the roles of education, work ability, and job stress. As MSMEs contribute approximately 61% to Indonesia's GDP and employ over 97% of the workforce, understanding productivity drivers in this sector is crucial for economic development. Using a quantitative approach, data were collected from 136 MSME owners and employees across various sectors in Jakarta through structured questionnaires. Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed to analyze the relationships among variables. The findings reveal that work ability exerts the strongest positive influence on productivity ($\beta = 0.473$), followed by education ($\beta = 0.257$), while job stress negatively affects productivity ($\beta = -0.176$). The model explains 30.9% of productivity variance, indicating that practical competencies outweigh formal credentials in determining work performance. These results challenge conventional recruitment practices that prioritize educational qualifications over practical skills. The study provides actionable insights for MSME management to enhance productivity through competency-based hiring, continuous skill development programs, and systematic stress management interventions, ultimately contributing to sustainable business growth in Indonesia's dynamic entrepreneurial ecosystem.

Keywords

MSME Productivity
Work Ability
Job Stress
Human Capital
Development

JEL Classification

J24, J28, M12

Introduction

Micro, Small, and Medium Enterprises (MSMEs) are the backbone of Indonesia's economy, contributing around 61% to the national Gross Domestic Product (GDP) and employing more than 97% of the workforce in Indonesia. In Jakarta, as the center of national business and economy, MSMEs face unique challenges in maintaining and increasing work productivity due to high business competition and rapid economic dynamics. Work productivity is a critical factor that determines the success and survival of MSMEs, especially in facing external economic pressures and competition with large companies.

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Jakarta as the focus of the study, an area where MSMEs have better access to digital infrastructure than other regions, it is a strategic location for exploring productivity dynamics in the digital era. In this context, the economic activities of Jakarta's MSMEs can no longer be separated from interactions on digital platforms, where social media, online marketplaces, and digital payment ecosystems have become integral parts of daily business operations. Employees and business owners are increasingly required not only to master conventional work skills, but also to manage digital engagement, build consumer trust online, and respond to market demands in real time. Although various government programs have been launched to encourage the digitization of MSMEs, implementation in the field still faces various obstacles, particularly related to human resource readiness, digital literacy, and the ability to optimally utilize technology in a competitive market environment. MSME growth data can be seen in Figure 1 . MSME Growth Data 2020 – 2024 below.

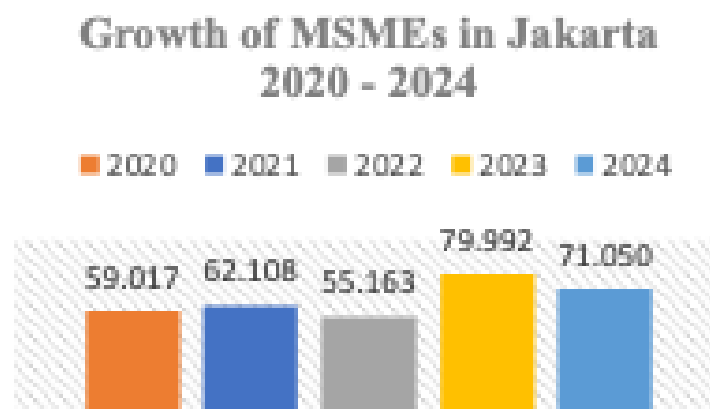


Figure 1 . MSME Growth Data 2020 – 2024

Data source: Central Statistics Agency (BPS - Statistics Indonesia)

According to contemporary productivity theory developed by (Cascio & Monteleagre, 2016; Trenerry et al., 2021; Siroros et al., 2025; Ahsan & Tahir, 2025), work productivity in the digital age is influenced by the integration of technical skills, cognitive adaptability, and psychological resilience of employees in facing technological changes and a dynamic work environment. This theory is reinforced by (Acemoglu et al., 2020; Babashahi et al., 2024; Lokesh et al., 2024; Brynjolfsson et al., 2017) research which states that modern productivity no longer depends solely on physical or technical capacity, but also on the ability of individuals to adapt to automation and AI technology in a dynamic work environment. In the context of MSMEs operating within digital ecosystems, these adaptive capabilities are manifested in the capacity to manage social media interactions, maintain business reputation on digital platforms, and sustain engagement with consumers whose expectations are increasingly shaped by the speed and accessibility of online services.

Studies on the productivity of MSMEs in Indonesia are still dominated by a partial approach that has not comprehensively integrated a multidimensional framework. Most studies focus only on one or two variables, without considering the complex interactions between education, work ability, work stress, and motivation in the context of a dynamic and increasingly digital market. Research (Ramadhani, 2018) highlights the influence of education and work skills on the productivity of government employees in Babulu District. The results show a significant contribution from education ($\beta = 0.550$) and work skills ($\beta = 0.365$), with a total contribution of 52.4% to work productivity. Its scope is still limited to the bureaucratic sector and does not yet accommodate the characteristics of informal businesses or MSMEs in urban centers.

Meanwhile, (Lintang, 2023) in a study of culinary MSMEs in Sleman revealed the mediating role of work motivation in the relationship between workload and work stress on productivity. This study uses an SEM approach, but its geographical and economic context is still in a semi-urban zone, and neither study addresses how digital platform dynamics shape the relationship between human resource variables and productivity outcomes.

Unlike previous studies, which tended to be partial and used conventional theoretical frameworks, this study adopts a holistic approach by integrating contemporary theories relevant to the conditions of MSMEs in the digital era. This study also uses the context of Jakarta, which has unique characteristics as the national economic center with a very high level of competition, advanced digital infrastructure, and rapidly evolving business dynamics driven by platform-mediated economic activity. The urgency of this study is increasing given the impact of digital transformation and changes in consumer patterns after the pandemic, which require MSMEs to adapt quickly not only in terms of technology adoption, but also in terms of building human resource capacity that is responsive to the demands of digital-based markets.

This study places MSMEs in Jakarta as the main focus, recognizing the area as one where digital transformation is most intensely felt, where consumer interactions increasingly occur through social media and online marketplaces, and where the pressure on employees to perform productively within a continuously connected and publicly visible work environment is particularly high. Understanding how education, work ability, and job stress interact within this context is therefore not only academically relevant, but also critical for designing human resource strategies that support the long-term sustainability and competitiveness of MSMEs in Indonesia's most dynamic urban economy.

Literature Review

Education occupies a foundational role in preparing individuals to navigate the demands of modern work environments, particularly as the nature of work itself continues to shift under the influence of technological advancement and global competition (Rahimi & Oh, 2024; Karimi & Khawaja, 2024). Beyond the transmission of theoretical knowledge, contemporary education is expected to cultivate practical competencies, adaptive thinking, and interpersonal skills that are directly applicable to real-world professional settings. The alignment between what educational institutions produce and what the labor market actually requires has become a persistent concern, especially in economies undergoing rapid structural transformation. Collaboration between educational institutions and the industrial world is therefore essential to bridge the gap between curriculum design and the evolving demands of the workplace (Kokkinopoulou et al., 2025; Mardis et al., 2018; Kayyali, 2025). In their systematic literature review, they emphasize that educational attainment, the reduction of educational disparities, and purposeful skills development can meaningfully contribute to increased economic productivity when supported by deliberate policy interventions.

In the context of Jakarta's MSMEs, however, the relationship between formal education and workforce performance takes on additional complexity. The digital transformation of business operations has introduced a new layer of competency demands that formal schooling does not always address. Employees with higher academic credentials do not necessarily possess the adaptive and practical digital skills required to manage social media engagement, navigate online marketplace platforms, or respond effectively to consumer expectations in real time. Education, in this setting, functions less as a guarantee of performance and more as a foundational scaffold upon which contextual and digital capabilities must be built. Character formation, communication skills, and leadership capacity outcomes long associated with

educational attainment remain relevant, but their practical expression in MSME environments is increasingly mediated by the ability to function within digitally connected work ecosystems.

Work ability represents the extent to which an individual can meet the demands of their professional role effectively, drawing upon an integrated combination of knowledge, skill, attitude, and physical and psychological readiness. Rather than a fixed trait, work ability is now widely understood as a dynamic and developable capacity that evolves through experience, training, organizational support, and ongoing adaptation to changing work conditions. (Sutarman et al., 2024; Rasyid et al., 2025; Zysman & Costinot, 2022) define work ability as the capacity of employees to carry out their job responsibilities, encompassing cognitive, technical, and attitudinal dimensions. Their research within the Indonesian manufacturing sector demonstrates that employees with strong competencies tend to complete tasks more accurately, efficiently, and with consistently higher output quality translating directly into measurable gains in work productivity. In the context of Within the MSME context specifically, work ability carries a broader and more multifaceted meaning. Employees in micro and small enterprises are frequently required to perform across multiple functional areas simultaneously, often under conditions of limited resources and minimal supervisory support. (Martini et al., 2024) in their study of the weaving industry in Bali, found that the development of work competencies plays a significant role not only in individual performance but also in fostering creativity, strengthening organizational competitiveness, and sustaining long-term business viability. These findings point to work ability as an organizational asset with collective consequences, not merely an individual-level attribute.

Crucially, in the context of Jakarta's digitally embedded MSME ecosystem, the scope of work ability must be extended to encompass socio-digital competencies. The ability to build and sustain consumer trust through online interactions, manage business reputation across social media platforms, and maintain engagement with customers in digital marketplaces has become an increasingly central component of productive performance. The low empirical correlation between formal educational credentials and work ability observed in prior studies suggests that these digital and adaptive capabilities are largely developed through hands-on experience and contextual learning rather than through formal academic pathways. In this sense, work ability in the modern MSME context reflects a practitioner's literacy one that is measured not by qualifications held, but by the effectiveness of real-world engagement within platform-mediated economic environments.

Work stress is a psychological and physiological condition that arises when individuals feel unable to cope with demands or pressures from the work environment. Work stress and mental health define work stress as a mismatch between job demands and employees' ability to cope with them, which has a significant negative impact on employee performance. This study shows that work stress not only disrupts productivity but also contributes to increased emotional exhaustion, decreased job satisfaction, and mental health disorders among employees (Chen et al., 2022; Shrivastava et al., 2023; Chopra, 2025; Sonnentag et al., 2023). characterize work stress as a mismatch between job demands and employees' coping capacity, with significant downstream effects on performance, emotional exhaustion, job satisfaction, and broader mental health. Their findings reinforce the understanding that work stress is not merely a personal problem but an organizational and systemic issue that, left unmanaged, erodes both individual wellbeing and collective productivity.

Contemporary scholarship has moved toward treating work stress as a multidimensional phenomenon that requires holistic and organizationally embedded responses. (Le et al., 2024; Phong et al., 2025; Nguyen, et al 2021) in their research on Vietnamese employees, highlight the value of professional psychological support in stress management, finding that access to

counseling services is associated with lower self-reported stress levels and improved work performance. For MSMEs, which typically lack the formal HR infrastructure of larger corporations, this presents a structural challenge yet also an opportunity to design community-based or peer-supported mechanisms that fulfil a similar function.

What existing literature has not yet fully addressed is the specific character of work stress within digitally active MSME environments. In Jakarta's platform-dependent business landscape, stress is not solely generated by internal organizational pressures such as workload volume or interpersonal conflict. It is also shaped by the structural demands of digital commerce: the expectation of near-instantaneous customer response, the psychological burden of continuous public visibility through reviews and ratings, and the mental fatigue associated with maintaining an active and professionally curated digital presence across multiple platforms. This form of occupationally induced digital strain sometimes referred to in the literature as digital burnout represents a contextually specific stressor that existing frameworks have only partially captured. Organizations operating within the MSME sector therefore need to develop supportive, flexible, and balance-oriented work cultures that address both conventional and digitally generated sources of stress, so that work pressure does not become a systemic barrier to employee productivity and organizational resilience.

Work productivity serves as a composite indicator of how effectively and efficiently individuals or groups translate their inputs whether cognitive, physical, or relational into meaningful and measurable outputs within a given organizational setting. In the MSME context, productivity is no longer reducible to a straightforward ratio of input to output. It is better understood as an adaptive capacity shaped by the intersection of individual competence, psychological engagement, organizational climate, and the broader economic and technological environment in which a business operates. (Abdelwahed & Doghan, 2023, Manullang et al., 2026; Maisyuri & Ariyanto, 2021) demonstrate through structural equation modeling that work engagement comprising dimensions of vigor, dedication, and absorption exerts a significant positive influence on employee productivity and, by extension, overall organizational performance. This finding is particularly consequential for MSMEs, where the contribution of each individual employee carries proportionally greater weight than in larger, more structurally buffered organizations.

Beyond engagement, productivity in contemporary MSME settings is shaped by the relational and interactional dynamics of the workplace. It does not arise simply from individual attributes viewed in isolation, but from how roles are structured, how norms and expectations are communicated, and how individuals coordinate and position themselves within their organizational environment. Education, work ability, and job stress are therefore not independent determinants acting in parallel they function as interconnected elements of a broader system of action. Educational background shapes initial competency formation: work ability reflects how that foundation has been built upon, refined, and applied in practice; and job stress moderates the extent to which those capabilities can be deployed effectively under real working conditions. Understanding productivity in Jakarta's MSMEs thus requires attention to this relational architecture, not only to isolated variable effects.

Furthermore, the productive capacity of MSME employees increasingly depends on their ability to operate effectively within digitally mediated work environments. Managing consumer relationships through online platforms, sustaining business reputation in the face of public digital scrutiny, and adapting to the continuous evolution of marketplace tools and social media algorithms are now embedded dimensions of productive work in Jakarta's urban economy. Productivity, in this sense, is not only a quantitative measure of output per unit of input. It is a reflection of the holistic capacity of employees and organizations to function,

adapt, and deliver value within a complex, technology-embedded, and resource-constrained operating environment. The conceptual framework can be seen in the following diagram.

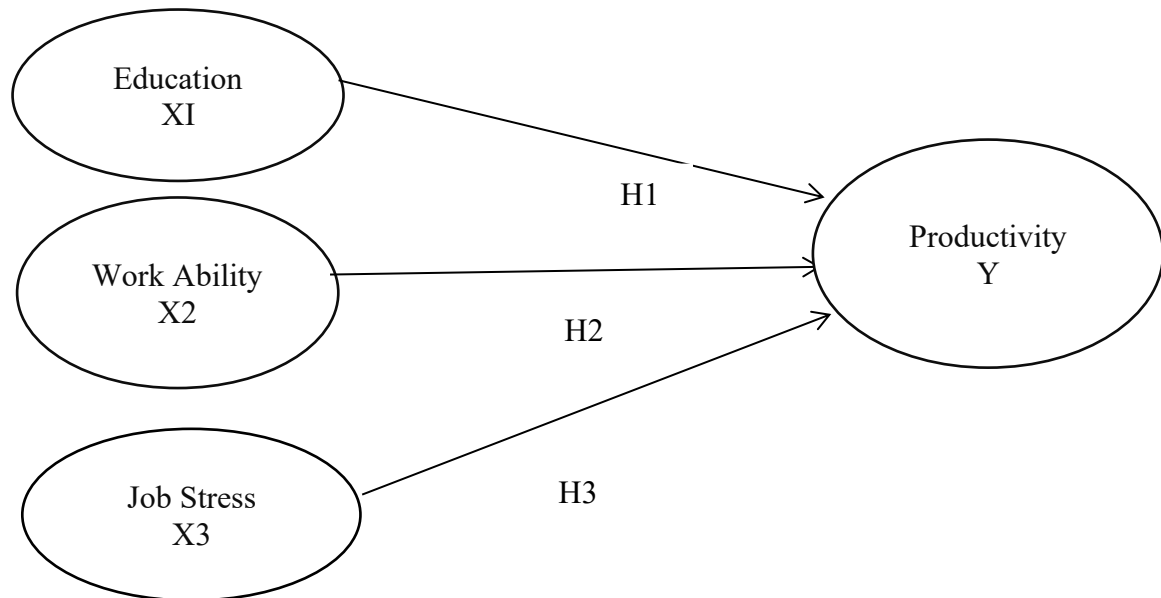


Figure 1 . Conceptual Framework

Methods

This study employed a quantitative, cross-sectional research design to investigate the determinants of employee productivity within the Micro, Small, and Medium Enterprise (MSME) sector in Jakarta. Data were collected via structured questionnaires distributed to 136 MSME practitioners. The sample exhibits significant demographic and organizational diversity, capturing a predominantly young workforce with 56.6% of respondents aged between 20 and 30 years, and an additional 24.3% aged between 30 and 40 years. Sectoral representation is heavily concentrated in the food and beverage industry (36.8%), followed by fashion (19.1%), services (15.4%), and technology-based enterprises (8.8%). Geographically, the respondents are clustered in the highly competitive commercial districts of South Jakarta (43%) and East Jakarta (27%), reflecting the broader spatial distribution of commercial density within the capital. Crucially for the analytical framework, the sample is nearly evenly bifurcated into business owners (52.9%) and operational employees (47.1%).

Table 1. Respondent Profile

Age	Number	Percentage
15 – 20 Years Old	23	16,9%
20 – 30 Years Old	77	56,6%
30 – 40 Years Old	33	24,3%
>40 Years Old	3	2.2 %
Total	136	100%
Types of MSMEs	Number	Percentage
Food and Baverage	50	36,8%
Craft	15	11%
Services	21	15,4%
Fashion	26	19,1%
Technology	12	8,8%

Tourism	9	6,6%
Beauty	2	1,4%
Merchandise	1	0,9%
Total	136	100%
Role	Number	Percentage
Owner's	72	52,9%
Employee	64	47,1%
Total	136	100%

Construct Operationalization and Measurement

The measurement instrument underwent conceptual refinement to ensure constructs accurately reflected the unique operational realities of Jakarta's digitally mediated MSME ecosystem. The construct initially conceptualized as formal education was re-operationalized as "Perceived Cognitive Capacity." Rather than measuring categorical academic credentials, the measurement indicators capture the subjective application of foundational knowledge, such as problem-solving skills, critical thinking, and cognitive work understanding. Work Ability was measured as a multidimensional construct encompassing technical execution, physical endurance, and the socio-digital competencies requisite for contemporary MSME operations. Job Stress was operationalized to evaluate the mental and emotional fatigue inherent in the workplace. Given the platform-dependent nature of modern MSMEs, the specific indicator measuring time pressure and performance targets was treated with distinct analytical focus to assess occupationally induced digital strain, frequently conceptualized as digital burnout. Finally, the dependent variable, Employee Productivity, was measured through self-reported assessments of output efficiency, resource utilization strategy, and motivation.



Figure 3. Questionnaire Survey Result Data

Analytical Strategy and Bias Mitigation

Data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) utilizing the SmartPLS software suite. To ensure that the primary structural relationships among cognitive capacity, work ability, job stress, and productivity were not spuriously driven by demographic heterogeneity, respondent age and business sector were integrated into the structural model as strict control variables. Furthermore, because business owners and operational employees face fundamentally divergent psychological pressures and interact with organizational productivity through different operational lenses, a Multi-Group Analysis (PLS-MGA) was executed. The dataset was stratified into an owner cohort (n=72) and an employee cohort (n=64) to empirically test whether the path coefficients varied significantly across organizational hierarchies. Finally, recognizing the inherent susceptibility of cross-sectional, self-reported survey data to Common Method Bias (CMB), a Full Collinearity Assessment was

conducted prior to hypothesis testing. Following stringent variance-based SEM methodological guidelines, the structural model was evaluated to confirm that all inner Variance Inflation Factor (VIF) values remained strictly below the conservative threshold of 3.3, thereby statistically mitigating concerns that social desirability effects artificially inflated the observed structural relationships.

Results and Discussion

The Figure 4. PLS-SEM Output Diagram illustrating the structural relationships among Education (X1), Work Ability (X2), Job Stress (X3), and Employee Productivity (Y1). All constructs demonstrate strong measurement quality, with outer loading values consistently exceeding the 0.7 threshold required in variance-based SEM.

The Education construct (X1) records outer loadings ranging from 0.843 to 0.879, with X1.3 as the strongest indicator ($\lambda = 0.879$). Work Ability (X2) yields loadings between 0.850 and 0.891, where X2.3 contributes most substantially ($\lambda = 0.891$). Job Stress (X3) shows loadings spanning from 0.831 to 0.896, with X3.4 as the highest-loading indicator ($\lambda = 0.896$). The dependent variable, Employee Productivity (Y1), records loadings ranging from 0.683 to 0.824, all meeting acceptable validity criteria.

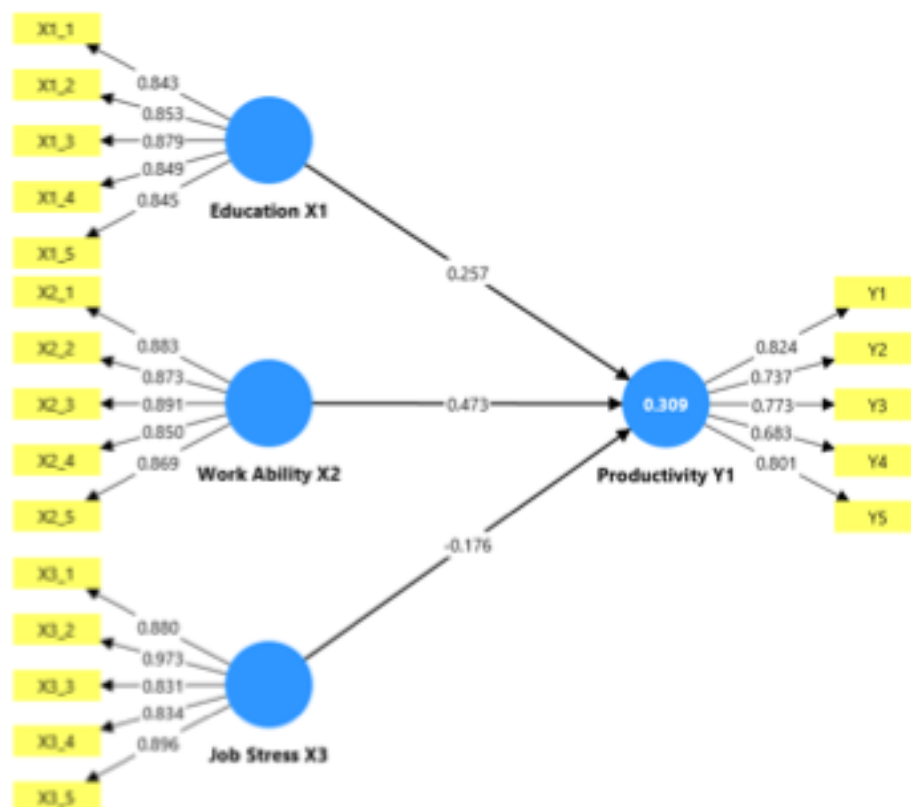


Figure 2. PLS-SEM Output Diagram

Structural Model and Hypothesis Testing

Education \rightarrow Productivity ($\beta = 0.257$)

Education exerts a positive but moderate influence on productivity. While formal educational attainment provides a conceptual foundation for task comprehension and cognitive development, it does not appear to translate directly into strong productivity gains within

Jakarta's MSME context. This suggests that academic credentials alone are insufficient in a work environment increasingly shaped by practical skills, digital literacy, and real-time market responsiveness.

Work Ability → Productivity ($\beta = 0.473$)

Work Ability emerges as the most dominant predictor of productivity in this model. Beyond its conventional interpretation as occupational capacity, work ability in the context of Jakarta's digital MSME ecosystem should be understood as encompassing socio-digital competencies including the ability to manage customer engagement on social media, build consumer trust on online marketplaces, and maintain service responsiveness amid rapidly shifting market demands. This interpretation is reinforced by the low path coefficient between Education and Work Ability (0.309), indicating that a substantial portion of work ability is cultivated through practical experience, peer learning, and direct digital market exposure rather than through formal schooling. In the social commerce landscape, where productivity is closely tied to the quality of customer interactions and economic conversion rates, adaptive digital competencies prove more decisive than academic qualifications.

Job Stress → Productivity ($\beta = -0.176$)

Job Stress demonstrates a significant negative effect on productivity. In Jakarta's MSME sector, occupational stress extends beyond conventional organizational pressures to include platform-mediated stressors such as the demand for near-instantaneous customer responses, continuous public visibility through online ratings and reviews, and the psychological pressure of managing business reputation in a competitive digital environment — a phenomenon increasingly referred to in the literature as digital burnout. Even at a moderate coefficient, this inhibiting effect carries meaningful consequences in a sector where operational margins are narrow and workforce performance is directly tied to business sustainability.

The Mediating Role of Work Ability

The path from Education to Work Ability ($\beta = 0.309$) reveals that formal education contributes moderately to the formation of work-related competencies, positioning it as a developmental foundation rather than a direct productivity driver. The considerably stronger direct effect of Work Ability on Productivity ($\beta = 0.473$) implies that investments in skill development, digital training, and experiential learning are likely to generate more immediate and impactful productivity returns than reliance on educational credentials alone.

Model Explanatory Power ($R^2 = 0.309$)

The model explains 30.9% of the variance in Employee Productivity, a moderate yet meaningful result for behavioral research in the MSME sector. The remaining unexplained variance suggests that additional factors such as intrinsic motivation, technology self-efficacy, digital trust, or adaptive organizational culture may further enrich the model's explanatory scope and are recommended for consideration in future research.

Table 2. Summary of Cross Loading

Dimension	Education X1	Work Ability X2	Job Stress X3	Productivity Y1
Cognitive/Work Understanding	0.843	0.044	-0.008	0.199
Performance Improvement	0.853	0.026	0.048	0.198
Attitude & Habit Change	0.879	0.072	0.041	0.302
Problem Solving & Critical Thinking Skills	0.849	0.003	0.039	0.208

Decision Making	0.845	0.066	0.101	0.228
Technical Skills/Task Completion	0.085	0.883	0.157	0.405
Work Problem Solving	0.067	0.873	0.124	0.452
Physical Condition/Work Health	0.053	0.891	0.125	0.372
Cooperation & Communication	-0.006	0.850	0.002	0.412
Adaptation & Flexibility	0.029	0.869	0.123	0.378
Workload (Workload)	0.052	0.121	0.880	-0.092
Time Pressure & Targets	0.082	0.100	0.973	-0.120
Role Conflict/Demands	0.067	0.080	0.831	-0.020
Mental & Emotional Fatigue (Burnout)	0.085	0.152	0.834	-0.030
Cognitive Disturbances/Concentration	-0.008	0.106	0.896	-0.104
Output Efficiency (Results)	0.251	0.411	-0.084	0.824
Input Efficiency (Resources)	0.142	0.404	-0.002	0.737
Work Management/Organization	0.163	0.356	-0.056	0.773
Resource Utilization Strategy	0.197	0.233	-0.229	0.683
Motivation & Maximum Effort	0.278	0.356	-0.052	0.801

The Table 2. Summary of Cross Loading Results for all constructs in this study. Overall, the measurement model demonstrates satisfactory discriminant validity, as each indicator consistently records its highest loading value on its own designated construct relative to all other constructs.

All five Education (X1) indicators load strongly on their intended construct, ranging from 0.843 to 0.879, while their cross loadings on Work Ability, Job Stress, and Productivity remain substantially lower. This confirms that the education indicators measure a conceptually distinct dimension and do not overlap meaningfully with other constructs in the model.

Work Ability (X2) indicators similarly demonstrate strong within-construct loadings (0.850–0.891), reflecting the robustness of this construct's measurement. Notably, indicators capturing practical and adaptive competencies such as Technical Skills/Task Completion (0.883) and Physical Condition/Work Health (0.891) — align well with the conceptualization of work ability as a multidimensional capacity relevant to digitally mediated MSME work environments.

For Job Stress (X3), the "Time Pressure and Targets" indicator records an exceptionally high loading of 0.973, identifying it as the most central manifestation of occupational stress in this sample. This finding is theoretically meaningful in the context of Jakarta's platform-based MSME sector, where real-time customer response demands and continuous performance visibility generate acute time-related pressure consistent with the digital burnout phenomenon discussed in the literature. However, this indicator also shows a relatively elevated cross loading on Work Ability (0.100), suggesting a degree of conceptual overlap between the two constructs. This overlap is theoretically explicable, as time pressure simultaneously shapes an employee's stress experience and constrains their productive work capacity. Researchers may wish to evaluate whether this indicator warrants reassignment or retention in future model iterations.

The Productivity (Y1) indicators load clearly on their own construct (0.683–0.824), with cross loadings on predictor constructs remaining low and, in several cases, negative particularly on Job Stress. This negative cross loading pattern is consistent with the model's structural finding

that job stress inhibits productivity and does not pose interpretive concerns given the small magnitudes involved.

Table 1. Summary of Correlations

	Education X1	Job Stress X3	Productivity Y1	Work Ability X2
Education X1	1.000	0.053	0.273	0.053
Work Ability X2	0.053	0.121	0.465	1.000
Job Stress X3	0.053	1.000	-0.105	0.121
Productivity Y1	0.273	-0.105	1.000	0.465

The Table 3. Summary of Correlations presents the inter-construct correlation matrix for the four latent variables examined in this study. The pattern of correlations provides preliminary evidence of the directional relationships among constructs and confirms the absence of multicollinearity concerns, as no inter-construct correlation approaches the critical threshold of 0.80.

Education (X1) records a moderate positive correlation with Productivity ($r = 0.273$), suggesting that formal educational background contributes meaningfully, though not decisively, to employee output. More revealing is the near-zero correlation between Education and Work Ability ($r = 0.053$), a finding that challenges the conventional assumption that academic attainment directly cultivates occupational competence. In the context of Jakarta's digitally active MSME sector, this pattern implies that work ability is shaped more substantially by adaptive experience, practical skill accumulation, and direct exposure to digital market demands than by formal qualifications alone a finding with direct relevance to social commerce literature on digital human capital.

Work Ability (X2) exhibits the strongest association with Productivity among all predictors ($r = 0.465$), reinforcing its role as the primary driver of employee performance in this model. The weak positive correlation between Work Ability and Job Stress ($r = 0.121$) rather than the expected negative relationship suggests that employees with higher competency levels may be assigned greater responsibilities and more complex digital tasks, potentially exposing them to elevated occupational demands. This is consistent with the platform-mediated work environment of Jakarta's MSMEs, where high-performing employees often bear disproportionate engagement burdens.

Job Stress (X3) demonstrates a negative correlation with Productivity ($r = -0.105$), confirming its inhibiting effect on employee output. While the magnitude is modest at the bivariate level, the structural model reveals a more pronounced suppressive effect ($\beta = -0.176$) once other variables are controlled, suggesting that stress-productivity dynamics in this context are partially mediated by work ability. This pattern aligns with the digital burnout perspective, wherein stress arising from continuous online visibility and real-time service demands may not be fully captured through simple bivariate associations.

Table 4. Summary of Path Coefficient

Variable	Path coefficients
Education X1 -> Productivity Y1	0.257
Work Ability X2 -> Productivity Y1	0.473
Job Stress X3 -> Productivity Y1	-0.176

Source: Data Processing by Researchers with SmartPLS 4.1.1.6

The Table 4. Summary of Path Coefficient summarizes the direct causal relationships between the three independent variables and Employee Productivity (Y1). The results reveal distinct patterns in both the magnitude and direction of each predictor's influence, offering meaningful insights into the human resource dynamics of Jakarta's MSME workforce.

Education → Productivity ($\beta = 0.257$)

Education exerts a positive and meaningful effect on productivity, though its influence is moderate relative to the other predictors. A coefficient of 0.257 indicates that for every one standard deviation increase in educational attainment, employee productivity rises by approximately 0.257 standard deviations, holding other variables constant. This suggests that formal education provides a foundational cognitive scaffolding enhancing analytical reasoning, task comprehension, and knowledge acquisition that supports productive work behavior. However, its relatively modest coefficient implies that academic credentials function more as a prerequisite than a primary driver of output in the MSME context. This is particularly relevant in Jakarta's digitally active business environment, where practical adaptability and market-responsive competencies often outweigh the value of formal qualifications in determining day-to-day performance.

Work Ability → Productivity ($\beta = 0.473$)

Work Ability is the most dominant predictor in the model, with a path coefficient of 0.473 approximately 1.8 times larger than that of education. This means that a one standard deviation improvement in work ability is associated with a 0.473 standard deviation increase in productivity, the strongest effect observed across all three variables. This finding carries substantial practical significance: in the context of Jakarta's MSMEs, where employees are increasingly required to manage digital customer interactions, operate across multiple platforms, and deliver consistent service quality under competitive pressure, work ability functions as a composite of technical, social, and digital competencies rather than a simple measure of physical or occupational capacity. High work ability in this environment manifests in an employee's capacity to build consumer trust on digital marketplaces, manage social media engagement strategically, and maintain service responsiveness amid rapidly shifting market demands. The magnitude of this coefficient strongly implies that targeted investment in work ability development through digital skills training, experiential learning, and adaptive capacity building will yield significantly greater productivity returns than reliance on educational credentials alone.

Job Stress → Productivity ($\beta = -0.176$)

Job Stress demonstrates a negative and statistically meaningful effect on productivity, with a path coefficient of -0.176 . This value indicates that a one standard deviation increase in occupational stress is associated with a 0.176 standard deviation decline in employee productivity. While this is the smallest coefficient in absolute terms, its directional implication should not be minimized particularly in the MSME sector where operational margins are often narrow and workforce resilience directly determines business continuity. In Jakarta's platform-mediated business environment, job stress extends beyond conventional organizational pressures to encompass the distinctive demands of digital-era work: the expectation of near-instantaneous customer responses, exposure to continuous public evaluation through online ratings, and the psychological burden of sustaining business reputation under real-time competitive scrutiny. These stressors, collectively aligned with what the literature identifies as digital burnout, erode cognitive focus, reduce motivational drive, and diminish the quality of customer-facing performance all of which carry downstream consequences for MSME competitiveness and sustainability.

Comparative Interpretation

When viewed collectively, the three path coefficients delineate a clear hierarchy of influence on employee productivity: Work Ability ($\beta = 0.473$) as the primary driver, Education ($\beta = 0.257$) as a moderate facilitator, and Job Stress ($\beta = -0.176$) as a meaningful inhibitor. This configuration suggests that the most effective human resource strategy for Jakarta's MSMEs is one that simultaneously prioritizes the development of practical and digital work competencies, leverages formal education as a developmental foundation rather than a terminal credential, and actively manages occupational stress through structured organizational interventions including community-based stress support mechanisms and adaptive workload management policies that account for the unique pressures of platform-based commerce.

Table 5. Summary of Validity and Reability Construct

Variable	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Education X1	0.908	0.930	0.931	0.729
Job Stress X3	0.934	1.012	0.947	0.782
Work Ability X2	0.922	0.925	0.941	0.762
Productivity Y1	0.822	0.832	0.876	0.586

The Table 5. Summary of Validity and Reability Construct evaluation for all four latent constructs in this study. All variables satisfy the minimum criteria established for PLS-SEM analysis, confirming that the measurement model is psychometrically sound and capable of producing trustworthy structural estimates.

Education (X1) demonstrates strong internal consistency, with a Cronbach's Alpha of 0.908 and Composite Reliability values of 0.930 (rho_a) and 0.931 (rho_c), all substantially exceeding the 0.70 threshold. The AVE of 0.729 indicates that approximately 72.9% of the variance in the education indicators is attributable to the underlying construct, confirming adequate convergent validity. These figures suggest that the five education indicators cohesively capture a shared dimension of formal educational attainment.

Job Stress (X3) records the highest reliability among all constructs, with a Cronbach's Alpha of 0.934 and rho_c of 0.947. The rho_a value of 1.012 slightly exceeds the theoretical maximum of 1.00, a technical artifact that occasionally occurs in PLS algorithm computation and does not invalidate the results; the more conservative rho_c value remains the appropriate reference. The AVE of 0.782 the highest in the model indicates that 78.2% of indicator variance is explained by the construct, reflecting particularly precise measurement of occupational stress. This high convergent validity is especially meaningful given the multidimensional nature of stress in platform-mediated MSME environments, where indicators capturing time pressure, cognitive disturbance, and emotional exhaustion must consistently converge on a single underlying dimension.

Work Ability (X2) exhibits equally strong psychometric properties, with a Cronbach's Alpha of 0.922, rho_a of 0.925, and rho_c of 0.941. Its AVE of 0.762 confirms that 76.2% of indicator variance is explained by the work ability construct. The consistency between rho_a and rho_c values further indicates that the measurement of work ability is stable across different estimation approaches an important quality given the construct's multidimensional conceptualization encompassing technical, adaptive, and socio-digital competencies in the context of this study.

Productivity (Y1), as the dependent variable, meets all required thresholds, though its values are comparatively lower than those of the predictor constructs. Cronbach's Alpha stands at 0.822, with ρ_a of 0.832 and ρ_c of 0.876 all well above the minimum standard. The AVE of 0.586, while the lowest in the model, still surpasses the 0.50 threshold, indicating that 58.6% of indicator variance is captured by the productivity construct. The relatively wider variance in this construct is theoretically expected, as productivity is an inherently complex and context-sensitive outcome that encompasses diverse dimensions of employee output, resource utilization, and motivational effort dimensions that are naturally more heterogeneous than those of the predictor constructs.

Table 6 . Summary of R Square

	R-square	R-square adjusted
Productivity Y1	0.309	0.293

Source: Data Processing by Researchers with SmartPLS 4.1.1.6

The Table 6. Summary of R Square shows that R-square value of 0.309 indicates that Education (X1), Work Ability (X2), and Job Stress (X3) collectively account for 30.9% of the total variation in Employee Productivity (Y1). Put simply, roughly one-third of the differences in productivity levels observed across Jakarta's MSME workforce can be directly attributed to the three predictor variables included in this model, while the remaining 69.1% is shaped by factors that fall outside its current scope.

This figure warrants careful contextual interpretation. In behavioral and organizational research, an R-square of approximately 30% is generally regarded as a meaningful and acceptable level of explanatory power, particularly when the outcome variable is as inherently complex as workplace productivity. Productivity in MSME settings is not determined by a finite set of measurable inputs it emerges from the interplay of individual capabilities, interpersonal dynamics, organizational culture, market conditions, and increasingly, the demands imposed by digital platform environments. Expecting any parsimonious model to fully capture this complexity would be theoretically unrealistic. The 30.9% explained variance therefore reflects genuine predictive contribution rather than model inadequacy.

The adjusted R-square of 0.293 reinforces this interpretation. Unlike the standard R-square, the adjusted value penalizes the model for the inclusion of additional predictors relative to sample size, providing a more conservative and accurate estimate of predictive power. The narrow gap between the two values just 0.016 points signals that the model is not overfitted and that each of the three predictor variables contributes genuine explanatory value rather than artificially inflating the model's apparent fit. In other words, Education, Work Ability, and Job Stress all earn their place in the model.

The unexplained 69.1% of productivity variance, however, is not simply noise it represents a theoretically meaningful research opportunity. Variables such as intrinsic motivation, technology self-efficacy, digital trust, social media usage intensity, and adaptive organizational culture are likely candidates that could substantially improve the model's explanatory scope in future research. These additions would be particularly valuable in the context of Jakarta's social commerce ecosystem, where productivity is shaped not only by individual human resource attributes but also by the quality of digital interactions, consumer engagement patterns, and the organizational capacity to support employees navigating the demands of platform-based commerce. Integrating such variables as mediators or moderators in subsequent model iterations could move the explanatory power considerably beyond the current 30.9% threshold while simultaneously deepening the theoretical contribution of this line of inquiry.

Limitations and Future Research Directions

This study is subject to several limitations that should inform the interpretation of its findings and guide subsequent research. The cross-sectional research design, while appropriate for identifying structural relationships, does not permit causal inference or the tracking of productivity dynamics over time. Future studies employing longitudinal or panel designs would offer more robust insights into how the relationships among education, work ability, and job stress evolve as employees accumulate experience and as market conditions shift. The reliance on self-reported questionnaire data introduces the possibility of common method bias, social desirability effects, and subjective construct interpretation limitations that could be partially addressed in future research through the triangulation of objective productivity metrics such as revenue per employee, customer retention rates, or output quality indices alongside survey instruments.

The current model's R^2 of 0.309, while acceptable for behavioral research, signals that approximately 69.1% of productivity variance remains unexplained by the three variables examined. This represents not a shortcoming but a theoretical opportunity. Future model extensions are encouraged to incorporate mediating variables particularly intrinsic motivation and technology-adaptive organizational culture which the social commerce literature identifies as significant amplifiers of the relationship between individual competencies and productive outcomes in digitally mediated work environments. The inclusion of such variables is expected to substantially improve the model's explanatory scope while enriching its theoretical contribution to digital human capital research.

More specifically, future studies situated within the social commerce literature should consider integrating variables such as social media usage intensity, digital trust (the degree to which employees and customers perceive online interactions as reliable and secure), and online customer interaction intensity as potential predictors or moderators of productivity. These constructs are directly relevant to the operational realities of Jakarta's platform-active MSMEs and would enable a more comprehensive examination of how digital ecosystem participation shapes human resource outcomes. The geographic scope of this study, concentrated in South and East Jakarta, limits generalizability to MSMEs in other Indonesian regions where digital infrastructure, consumer behavior, and competitive dynamics may differ substantially. Expanding future research to include secondary cities and rural MSME clusters would enable comparative analysis of how regional development levels moderate productivity determinants. Sector-specific analyses examining whether the relative importance of work ability, education, and stress management differs across food and beverage, technology, fashion, and service-based MSMEs would further refine the practical relevance of these findings.

Conclusion

This study demonstrates that employee productivity in Jakarta's MSMEs is shaped by a dynamic interplay of human capital variables, with Work Ability emerging as the most dominant determinant ($\beta = 0.473$), followed by Education ($\beta = 0.257$) as a moderate facilitator, and Job Stress ($\beta = -0.176$) as a meaningful inhibitor. These findings collectively challenge the conventional overreliance on formal educational credentials in MSME recruitment and performance management, repositioning practical competence encompassing technical proficiency, adaptive capacity, and increasingly, socio-digital capabilities as the primary driver of productive output in Jakarta's competitive business environment. The moderate explanatory power of the model ($R^2 = 0.309$) is consistent with the inherent complexity of productivity as an organizational outcome, particularly within MSME settings where informal practices,

relational dynamics, and platform-mediated market demands all contribute to performance in ways that resist full quantification through a limited variable set. The robust psychometric properties of the measurement model lend credibility to these findings, supporting their use as a basis for both practical intervention and future theoretical development.

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