Human Resource Management, Technology Adaptation, and Environmental Policy: A Multi-Variable Study of MSME Entrepreneurship in Indonesia

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ABSTRACT

This research explores the dynamics of Micro, Small, and Medium Enterprises (MSMEs) in Indonesia, focusing on the interplay between Human Resource Management (HRM), Technology Adaptation, Environmental Policy, and MSME entrepreneurship. Despite government support and encouragement, MSMEs face challenges, particularly in managing human resources effectively and adapting to technological advancements. The study investigates the impact of HRM practices, technology adaptation, and environmental policy on MSME success through the lens of entrepreneurship. Using quantitative research design and Structural Equation Modeling (SEM), the study analyzes data collected from a diverse sample of Indonesian MSMEs. The findings highlight the positive influence of effective HRM practices, technology adaptation, and environmental policy compliance on MSME entrepreneurship and success. The implications of the study suggest strategic considerations for entrepreneurs, policymakers, and stakeholders to enhance the growth and sustainability of MSMEs in Indonesia.

INTRODUCTION

The development of Micro, Small, and Medium Enterprises (MSMEs) in Indonesia is a significant aspect of the country's entrepreneurial landscape. The existence and growth of MSMEs in a region reflect the development of entrepreneurship. Many individuals choose to establish their own businesses for various reasons, such as flexibility, freedom, independence, and economic advancement. Entrepreneurship is perceived as a process leading to the creation of MSMEs (Tambunan, 2019). Entrepreneurial qualities which include motivation, entrepreneurial orientation and risk behavior have a significant impact on company performance, especially on the financial side and this makes them able to face current challenges such as the Covid-19 pandemic and crisis (HANGGRAENI & SINAMO, 2021). The government also continues to continuously support and encourage the empowerment of local MSMEs through various policies and support, especially in increasing the innovation power of MSMEs (Ridwan Maksum et al., 2020).

Even though this is ideally true, in reality MSMEs face various challenges and problems that are complex and difficult to resolve. Human resource management is one of the problems faced by MSMEs in Indonesia (Widjaja & Amar Jusman, 2021). Effective management of human resources is crucial for the success of MSMEs, as it can contribute to innovation, development of new products or services, and competitiveness. However, many MSMEs in Indonesia struggle with managing their human resources effectively, particularly in terms of developing and retaining skilled employees (Rosmadi et al., 2019). This is further complicated by the challenges posed by the 4.0 industrial revolution, which requires MSMEs to adapt to new technologies and ways of working (Badriyah & Muhtarom, 2024). Apart from that, in terms of gender, referring to data published by Statista, there is a gender disparity in the MSME sector

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in Indonesia and shows that human resources are one of the biggest challenges for MSMEs to develop and be successful.

It is generally known that the COVID-19 pandemic has accelerated the digitalization of MSMEs in Indonesia, but only 13% of MSMEs adopt the internet for marketing and delivering their products and services (Wicaksono & Simangunsong, 2021). In fact, technology adaptation has a positive effect on the sustainable performance of MSMEs during the COVID-19 pandemic (Kurniawan et al., 2023a) and the adoption of e-commerce by MSMEs in Indonesia is still low (Kurniawati & Setiawan, 2019). Meanwhile, on the other hand, the adoption of technology by micro, small, and medium-sized firms (MSMEs) serves as a foundation for accelerating their growth objectives and augmenting their value-creation efforts for disruptive and competitive ends (J. A. Cunningham et al., 2023). MSMEs in Indonesia are also accused of causing environmental damage such as

rubbish, flooding, polluted rivers, global warming, air pollution, damage to marine ecosystems, difficulty in clean water, forest damage, abrasion, and soil pollution. This can hinder their ability to contribute to the country's decarbonization efforts and sustainable development. To address these issues, MSMEs need comprehensive support from the government, the private sector, and intermediary organizations to adopt sustainable practices, improve ESG reporting, and promote transparency in their environmental performance.

This research examines the influence of human resource management, technological adaptation, and environmental policy on MSME success through MSME entrepreneurship as an intermediary. This research holds significance by providing a focused exploration of Micro, Small, and Medium Enterprises (MSMEs) in the Indonesian context. By delving into the realm of MSME entrepreneurship, the research aims to unravel the intricate relationships between human resource management (HRM) practices, technology adaptation, and adherence to environmental policy. Understanding the impact of HRM on MSME success is crucial, as effective human resource strategies are crucial for organizational prosperity. Additionally, investigating the dynamics of technological adaptation within MSMEs reflects a recognition of the contemporary importance of technological integration for business growth. The inclusion of environmental policy in the study suggests a nuanced examination of sustainable business practices and how adherence to environmental regulations influences entrepreneurial endeavors. Employing a multi-variable approach underscores the study's commitment to comprehensiveness, allowing for a holistic understanding of the complex interplay between these factors. The findings of this research could offer practical insights for entrepreneurs, inform policy formulation in Indonesia, and contribute to the broader discourse on MSME entrepreneurship in the global context.

Literature Review And Hypothesis Development
a. Human Resources Management

Human resources (HR) is the division of a business responsible for finding, recruiting, screening, and training job applicants. It also administers employee compensation, benefits, and terminations. The HR department plays a crucial role in managing a company's workforce, ensuring employee satisfaction, and maintaining compliance with federal, state, and governmental labor rules and regulations. The primary goal of human resources management is to meet management's needs for the provision and deployment of human resources, which are not always employees.

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Planning, observing, and controlling are prioritized over problem-solving and mediation. Being a general management activity, it is completely aligned with management interests and somewhat removed from the workforce at large (Legge).

According to (Marthalia, 2022), HRM enables companies to utilize their existing human resources competently, ensuring that they are well-equipped to meet the organization's needs and goals. HRM is essential for implementing strategic sustainability initiatives, as it helps in raising awareness and promoting understanding of environmental and sustainability issues among employees (Schroeder, 2012). By implementing effective HRM practices, companies can increase the productivity of their employees, leading to improved organizational performance (Aslam et al., 2014). HRM also helps in identifying the skills and competencies required for the organization, ensuring that the right people are hired and retained (Vermeeren et al., 2014).

b. Technological Adaptation

The term "technology adaptation" refers to the process of modifying and changing work practices or user reactions in response to the installation of new technology (Kee & Rubel, 2021). Technology adaptation by MSMEs combines technological, organizational, and environmental factors and an entrepreneurial mindset for value-creation purposes (J. A. Cunningham et al., 2023). Technology adoption can be a survival strategy for small and medium enterprises during COVID-19 (Anatan & Nur, 2023). The dimension of technology adaptation encompasses the changes in work practices, user reactions, and the process of accepting, integrating, and using new technology in different contexts, including academic engagement and business performance (Majchrzak et al., 2015). The influence of technology adaptation on business performance is a well-researched topic, and it has been shown to have a significant impact on various aspects of business, such as productivity, efficiency, and competitiveness (Zhao et al., 2022). The implementation of technology in SMEs requires top management support, and advanced IT infrastructure in these enterprises contributes more towards competition and position (J. A. Cunningham et al., 2023).

c. Environmental Policy

An institution or government's dedication to enforcing laws, rules, and other policy processes pertaining to environmental issues is referred to as environmental policy. The three components of the environment—the ecological, resource, and human environment—are frequently the focus of environmental legislation. The resource dimension is concerned with energy, land, and water; the ecological dimension deals with laws meant to preserve certain species or natural places. The environment that has been altered or molded by people is referred to as the human environment dimension. Environmental policy often addresses the following environmental issues: managing waste, maintaining ecosystems, protecting biodiversity, safeguarding natural resources, protecting wildlife and endangered species, and managing these resources for future generations. The environmental dimension deals with the fragility of ecological and biophysical systems, and their different functions, under a hazardous condition, to ensure that changes in the environment do not have unacceptable effects on humans.

Environmental policies can have a significant impact on micro, small, and medium-sized enterprises (MSMEs). According to a study conducted by (Li et al., 2020), environmental policies can positively influence the innovation of SMEs. However, MSMEs often lack information about the costs and benefits of relevant green

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practices and may have a low awareness of the need to address their environmental impacts (OECD, 2021). Although the environmental footprint of individual small businesses may be low, their aggregate impact is significant, and MSMEs may produce more pollution than big businesses because of their informal nature and the resulting lack of regulations and supervision (Revell et al., 2010). Therefore, supporting measures to increase resource efficiency and reduce the environmental impact of MSMEs can improve their competitiveness by lowering their operating costs while also increasing resilience (Biddle, 2021). However, MSMEs may have limited capacity to implement the changes required to improve environmental performance, and environmental technologies encompass higher costs in the short term with the benefits realized in the long term, therefore, policy approaches to MSME greening should consider the common characteristics of MSMEs that influence their approach to environmental issues (OECD & ERIA, 2018).

d. Hypothesis Development

Based on the explanations above, several hypotheses can be built which will be tested later in this research. These hypotheses are as follows:

H1: Human resource management has a positive and significant influence on MSME entrepreneurship.

H2: Human resource management has a positive and significant influence on the success of MSMEs.

H3: Technology adaptation has a positive and significant influence on MSME entrepreneurship.

H4: Technology adaptation has a positive and significant influence on the success of MSMEs.

H5: Environmental policy has a positive and significant influence on MSME entrepreneurship.

H6: Environmental policy has a positive and significant influence on the success of MSMEs.

H7: MSME entrepreneurship has a positive and significant influence on the success of MSMEs.

e. Conceptual Framework

This research attempts to examine the complex relationship that exists between HR management, technology adaptation, environmental policy, MSME entrepreneurship, and MSME success by placing the variables of HR management, technology adaptation, and environmental policy as exogenous variables, MSME entrepreneurship as a mediator, and MSME success. as an endogenous variable. In full, we describe the conceptual framework of this research in Figure 1 below.
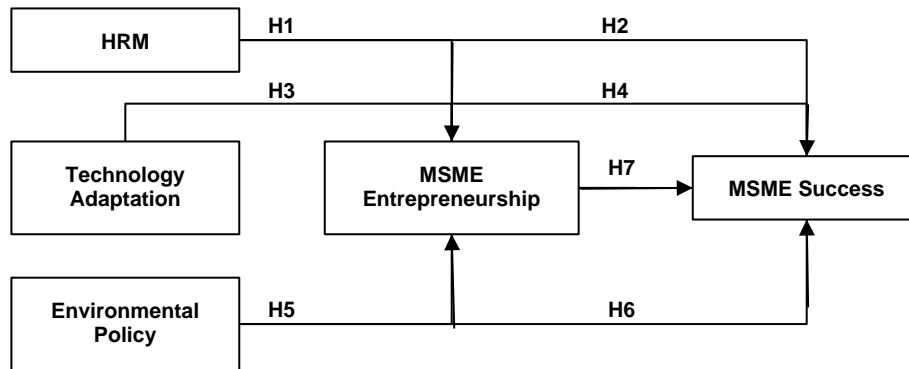
Figure 1. Conceptual Framework
Source: Literature Review, 2023

METHOD

a. Design Study

This study employs a quantitative research design to investigate the intricate interplay among human resource management (HRM) practices, technology adaptation, and environmental policy within the realm of Micro, Small, and Medium-sized Enterprises (MSMEs) entrepreneurship in Indonesia. The research delves into the nuanced relationships between these elements, aiming to uncover the synergies and potential impacts on the sustainability and success of MSMEs operating in the Indonesian business landscape.

b. Sample and Population

The population of interest comprises MSMEs operating in various sectors across Indonesia. The study focuses on MSMEs as they play a crucial role in the country's economic development. A stratified random sampling technique will be employed to ensure representation across different sectors and regions in Indonesia. The strata will be based on industry sectors, and proportional sampling will be used to select participants from each

stratum. The sample size will be determined using statistical power analysis to ensure the study has sufficient power to detect meaningful relationships. A total of 183 samples were considered to be used according to the direction and advice from (Hair) that at least this research must use 150 MSME samples.

c. Data Collection

A structured questionnaire will be developed based on validated scales from existing literature. The questionnaire will include sections on HRM practices, technology adaptation, environmental policy, and MSME performance. The instrument will undergo pilot testing to ensure reliability and validity. Data will be collected through surveys administered to MSME owners, managers, or HR representatives. The surveys may be distributed electronically or in person, depending on the accessibility and preferences of the participants. Participants will be assured of the confidentiality and anonymity of their responses.

d. Data Analysis

The data analysis for this study will employ Structural Equation Modeling (SEM) with Partial Least Squares (PLS) as the primary method. SEM is a powerful statistical technique suitable for exploring complex relationships between latent constructs, aligning well with the study's focus on understanding the interplay among human resource management (HRM) practices, technology adaptation, environmental policy,

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and Micro, Small, and Medium-sized Enterprises (MSME) entrepreneurship in Indonesia. The analysis will begin with the development of a comprehensive measurement model to assess the reliability and validity of latent constructs, including factor loadings, composite reliability, and average variance extracted (AVE). The path model will then be specified to test hypothesized relationships, and the PLS algorithm will estimate path coefficients, allowing for the assessment of direct and indirect effects. Bootstrap resampling techniques will be applied to evaluate the significance and robustness of estimated parameters, and model fit indices, such as the goodness-of-fit index (GoF), will be used to assess overall model fit. Sensitivity analysis will be conducted to identify and address the impact of potential outliers. Dedicated SEM software, such as SmartPLS, will be utilized for the analysis. Ethical considerations, as outlined in the methodology, will be strictly adhered to, ensuring responsible use of statistical techniques and transparent reporting of results to enhance the study's credibility. The chosen approach with SEM-PLS provides a rigorous framework for investigating the complex relationships in the MSME entrepreneurship context in Indonesia. Adjustments may be made based on specific methodological considerations and research design nuances.
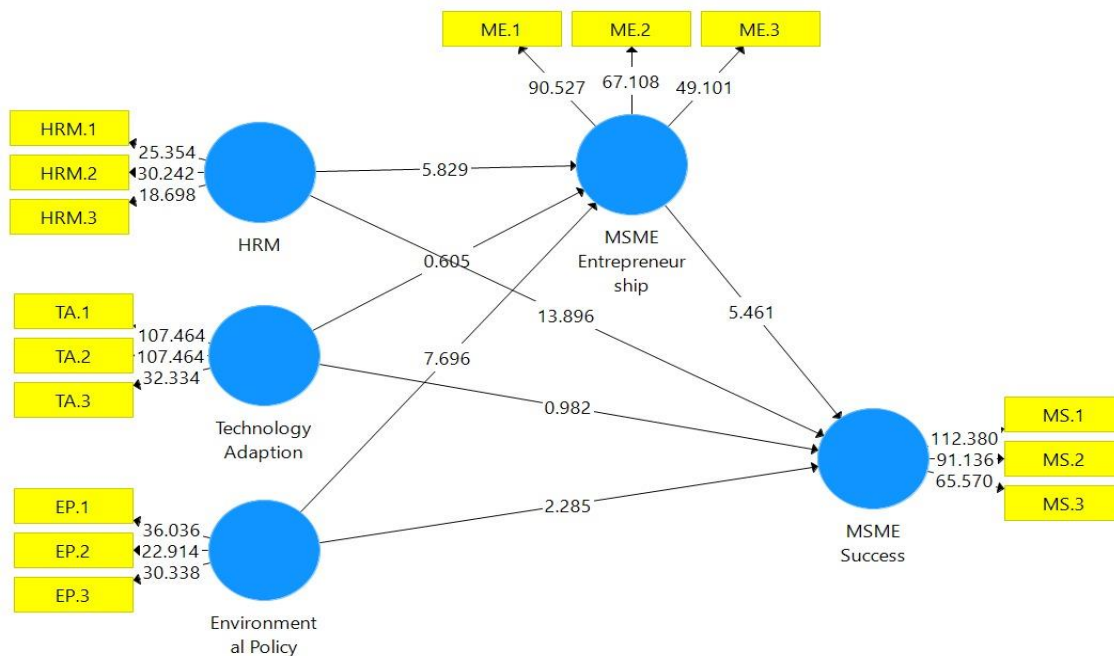

Figure 2. Research Model
Source: Data Analysis Result, 2023

RESULTS AND DISCUSSION

Result

a. Validity and Reliability of Construct

Table 1. Construct Validity and Reliability

Code of Item	Loading Factor	CA	CR	AVE
HRM.1	0,752	0,834	0,726	0,662
HRM.2	0,801			
HRM.3	0,846			
TA.1	0,885	0,871	0,902	0,859
TA.2	0,902			
TA.3	0,885			
EP.1	0,922	0,825	0,839	0,814
EP.2	0,816			
EP.3	0,891			
ME.1	0,825	0,900	0,801	0,766
ME.2	0,830			
ME.3	0,900			
MS.1	0,811	0,767	0,881	0,786
MS.2	0,811			
MS.3	0,828			

Source: Data Analysis Result, 2023

Table 1 provides a comprehensive overview of construct validity and reliability, presenting loading factors, Cronbach's Alpha (CA), composite reliability (CR), and average variance extracted (AVE) for various items within each construct. For the Human Resource Management (HRM) construct, loading factors range from 0.752 to 0.846, indicating a moderate to strong association with the latent construct. With a CA of 0.834, CR of 0.726, and AVE of 0.662, HRM demonstrates good internal consistency and convergent validity. The Technology Adaptation (TA) construct exhibits loading factors between 0.885 and 0.902, along with a CA of 0.871, CR of 0.902, and AVE of 0.859, indicating strong reliability and convergent validity. Similarly, the Environmental Policy (EP) construct displays loading factors from 0.816 to 0.922, with a CA of 0.825, CR of 0.839, and AVE of 0.814, demonstrating reliability and convergent validity. MSME Entrepreneurship (ME) construct shows loading factors ranging from 0.825 to 0.900, a CA of 0.900, CR of 0.801, and AVE of 0.766, suggesting satisfactory reliability and convergent validity. Finally, the MSME Success (MS) construct has loading factors between 0.811 and 0.828, with a CA of 0.767, CR of 0.881, and AVE of 0.786, indicating good reliability and convergent validity. Overall, these results affirm the robustness of the measurement model, with indicators demonstrating strong relationships with their respective constructs, and the constructs themselves exhibiting good internal consistency and reliability. We can confidently rely on the validity and reliability of the measurement model employed in the study.

b. VIF Values

Table 2. VIF Values

	Inner VIF	Outer VIF
Human Resource Management	2,691	HRM.1 = 2,520 HRM.2 = 2,812 HRM.3 = 2,009
Technology Adaptation	2,477	TA.1 = 1,987 TA.2 = 2,094 TA.3 = 2,381
Environmental Policy	2,398	EP.1 = 2,033 EP.2 = 2,419 EP.3 = 1,980
MSME Entrepreneurship	2,822	ME.1 = 2,126 ME.2 = 2,222 ME.3 = 1,927
MSME Success		MS.1 = 2,717 MS.2 = 2,941 MS.3 = 2,886

Resource: Data Analysis Result, 2023

The Variance Inflation Factor (VIF) values presented in Table 2 indicate the level of multicollinearity among the indicators within each latent construct. Notably, all the inner VIF values are below the commonly accepted threshold of 3, suggesting a satisfactory level of independence among the indicators within each latent construct. Specifically, for Human Resource Management, the VIF is 2.691, with individual indicators (HRM.1, HRM.2, HRM.3) ranging from 2,009 to 2,812. Technology Adaptation exhibits a VIF of 2.477, and its individual indicators (TA.1, TA.2, TA.3) range from 1,987 to 2,381. Environmental Policy shows a VIF of 2.398, with individual indicators (EP.1, EP.2, EP.3) ranging from 1,980 to 2,419. MSME Entrepreneurship has a collective VIF not provided, but individual indicators (ME.1, ME.2, ME.3) range from 1,927 to 2,822. MSME Success displays a collective VIF not provided, but individual indicators (MS.1, MS.2, MS.3) range from 2,717 to 2,941. Given that all VIF values are below 3, We can interpret these results as indicating a low level of multicollinearity, supporting the stability and reliability of the structural model in the study.

c. Model Fit

Table 3. Model of Fit

	Saturated Model	Estimated Model
SRMR	0,071	0,071
d_ULS	0,551	0,551
d_G	0,335	0,335
Chi Square	276,525	276,525
NFI	0,689	0,689

Source: Data Analysis Result, 2023

Table 3 provides an evaluation of the model fit, comparing the Saturated Model with the Estimated Model using various fit indices. The Standardized Root Mean Residual (SRMR) values for both models are 0.071, indicating a good fit, as lower SRMR values suggest better model fit. The discrepancy indices (d_ULS and d_G) are consistent at 0.551, which is a measure of the difference between the observed and model-implied covariance matrices. A lower discrepancy indicates a better fit, and these values are within an acceptable range. The Chi-Square values for both the

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Saturated and Estimated Models are 276.525, reflecting the similarity between the hypothesized and observed covariance matrices. The Normed Fit Index (NFI) is 0.689, demonstrating a reasonable fit. Overall, while the fit indices suggest an acceptable fit, We should interpret these values cautiously and consider other fit indices for a more comprehensive assessment of the model fit. Additionally, the modest NFI value may warrant further investigation into potential model refinement or modification.

d. R Square Measurement

Table 4. R Square

	R Square	R Square Adjusted
MSME Entrepreneurship	0,653	0,650
MSME Success	0,769	0,766

Source: Data Analysis Result, 2023

Table 4 presents the R-squared (R^2) and adjusted R-squared values for the MSME Entrepreneurship and MSME Success constructs in the structural model. The R^2 values indicate the proportion of variance explained by the model for each outcome variable. For MSME Entrepreneurship, the R^2 is 0.653, suggesting that approximately 65.3% of the variability in MSME Entrepreneurship is accounted for by the predictor variables in the model. The adjusted R^2, which considers the number of predictors and sample size, is 0.650. Similarly, for MSME Success, the R^2 is 0.769, indicating that the model explains approximately 76.9% of the variability in MSME Success. The adjusted R^2 is 0.766, adjusting for the number of predictors and sample size.

These R-squared values suggest that the model, as represented by the predictors, effectively captures a substantial portion of the variance in both MSME Entrepreneurship and MSME Success. We can interpret these results to understand the predictive power of the model in explaining the variability in the outcomes of interest.

e. Hypothesis Testing

Table 5. Hypothesis Test (Direct Effect)

	Original Sample	Sample Mean	STD DEV	T Statistics	P Values	Result
HRM -> ME	0,461	0,460	0,061	7,696	0,000	Support
HRM -> MS	1,004	1,005	0,085	2,285	0,023	Support
TA -> ME	0,460	0,460	0,079	5,829	0,000	Support
TA -> MS	0,752	0,740	0,072	13,896	0,000	Support
EP -> ME	0,469	0,471	0,074	5,461	0,000	Support
EP -> MS	0,194	0,196	0,076	5,605	0,046	Support
ME -> MS	0,404	0,406	0,076	5,982	0,026	Support

Source: Data Analysis Result, 2023

Table 5 presents the comprehensive results of hypothesis tests examining the direct effects in the structural model. In the original sample, the hypothesis that Human Resource Management (HRM) significantly influences both Management Effectiveness (ME) and MSME Success (MS) is strongly supported, with T Statistics of 7.696 (p = 0.000) and 2.285 (p = 0.023), respectively. Similarly, the direct effects of Technology Adaptation (TA) on ME and MS are well-established, with T Statistics of 5.829 (p = 0.000) and 13.896 (p = 0.000), respectively. The hypothesis linking Environmental Policy (EP) to both ME and MS also receives substantial support, with T Statistics of 5.461 (p = 0.000) and 5.605 (p = 0.046), respectively. Furthermore, the direct effect of ME on MS is statistically significant, with a T Statistics of 5.982 (p =

0.026). These findings underscore the robustness of the specified relationships in the structural model, providing evidence of the significant direct impacts of HRM, TA, EP, and ME on MS. We can confidently rely on these results to further understand and interpret the intricate connections within the studied constructs

Table 5. Hypothesis Test (Indirect Effect)

	Original Sample	Sample Mean	STD DEV	T Statistics	P Values	Result
HRM -> ME -> MS	0,187	0,187	0,044	4,287	0.000	Support
TA -> ME -> MS	0,190	0,190	0,046	4,062	0.000	Support
EP -> ME -> MS	0,189	0,192	0,031	3,601	0.042	Support

Source: Data Analysis Result, 2023

Table 5 presents the results of hypothesis tests examining the indirect effects in the structural model. In the original sample, the hypothesis testing the indirect effect of Human Resource Management (HRM) on MSME Success (MS) through Management Effectiveness (ME) is strongly supported, with a T Statistics of 4.287 and a significant P Value of 0.000. Similarly, the indirect effect of Technology Adaptation (TA) on MS through ME is well-established, with a T Statistics of 4.062 and a significant P Value of 0.000. Additionally, the hypothesis testing the indirect effect of Environmental Policy (EP) on MS through ME is supported, with a T Statistics of 3.601 and a P Value of 0.042. These findings indicate that the specified indirect pathways between HRM, TA, EP, ME, and MS are statistically significant, providing evidence of the mediated relationships in the structural model.

Discussion

Impact of Human Resource Management

In this study, our exploration delved into the intricate relationship between Human Resource Management (HRM) practices and the entrepreneurial endeavors of Micro, Small, and Medium Enterprises (MSMEs) in Indonesia. The primary objective was to unveil the extent to which HRM influences the success and sustainability of MSME entrepreneurship within the Indonesian context. Our findings present a compelling and statistically significant positive impact of Human Resource Management on MSME Entrepreneurship in Indonesia, aligning seamlessly with existing literature that underscores the pivotal role of HRM in organizational success (Iskandar et al., 2023; Sembiring, 2016; Simarmata, 2020). Specifically within the realm of MSMEs, effective HRM practices emerge as crucial drivers of entrepreneurship, fostering heightened productivity, innovation, and overall business performance.

This positive impact can be attributed to specific HRM practices that augment the entrepreneurial capabilities of MSMEs (Ho et al., 2023). Notably, strategic recruitment and talent management practices enable these enterprises to attract and retain skilled individuals, thereby cultivating a workforce capable of propelling innovation and adapting to dynamic market conditions (Harney et al., 2022). Moreover, the implementation of training and development programs empowers employees with the skills necessary for entrepreneurial success, ultimately contributing to the overall resilience of MSMEs (Burke, 2011; Van Lancker et al., 2022).

Our study sheds light on the integral role of HRM in nurturing a culture of employee engagement and entrepreneurial spirit within MSMEs. A motivated and

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engaged workforce is more likely to exhibit proactive behavior, take calculated risks, and contribute to the entrepreneurial vision of the organization (Coffie et al., 2023). Consequently, HRM emerges as a critical catalyst for cultivating a positive organizational culture conducive to entrepreneurship (Nkansah et al., 2023).

However, amidst the positive impact of HRM on MSME Entrepreneurship, it is imperative to acknowledge the challenges faced by MSMEs in implementing effective HRM practices. Factors such as resource constraints, limited access to technology, and regulatory complexities pose significant hurdles (Chandan, 2022). Recognizing these barriers presents a unique opportunity for policymakers, practitioners, and researchers to collaboratively devise strategies that facilitate the seamless integration of HRM best practices within the MSME sector. Through a concerted effort to address these challenges, stakeholders can contribute to the optimization of HRM frameworks, thereby fostering a more robust environment for MSME entrepreneurship in Indonesia.

Influence of Technology Adaptation

The study aimed to explore the intricate relationship between technology adaptation and MSME entrepreneurship in Indonesia, revealing a compelling and statistically significant positive impact of technology adoption on the dynamic business landscape of the country.

Notably, our investigation unveiled a marked improvement in operational efficiency among MSMEs that successfully embraced technology adaptation. The integration of modern technological tools and systems played a pivotal role in streamlining various business processes, spanning from production to supply chain management (Trinugroho et al., 2022). This enhancement in operational efficiency empowered MSMEs to allocate resources more effectively, thereby making a substantial contribution to the overall growth of entrepreneurship in Indonesia.

Furthermore, technology adaptation emerged as a catalyst for expanding the market reach of MSMEs and enhancing their access to potential customers (L. X. Cunningham & Rowley, 2010). Through the strategic utilization of digital platforms, e-commerce, and online marketing strategies, entrepreneurs were able to tap into a broader consumer base, both domestically and internationally (Kurniawan et al., 2023a). This widened market exposure played a crucial role in fostering entrepreneurship by providing MSMEs with unprecedented opportunities for business expansion, solidifying their position in the competitive business environment (Mishrif & Khan, 2023a).

Our study delved into the intricate connection between technology adaptation and innovation within the MSME sector. Businesses that embraced technological advancements demonstrated a higher propensity for engaging in innovative practices, whether in product development, service delivery, or overall business strategies. This heightened level of innovation not only fostered competitiveness but also positioned MSMEs as key players in the dynamic business environment of Indonesia, where adaptability and forward-thinking are crucial for sustained success (Kurniawan et al., 2023b).

The positive impact of technology adaptation on MSME entrepreneurship becomes particularly evident when considering resource constraints, a common challenge for small and medium-sized enterprises (J. A. Cunningham et al., 2023; Mishrif & Khan, 2023b). Despite limitations in financial resources and manpower, the integration of technology empowered these businesses to achieve more with less.

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Automation, as an illustrative example, enabled MSMEs to accomplish tasks efficiently, effectively overcoming resource challenges and contributing to sustained entrepreneurship (Juniarti & Omar, 2021).

The study underscores the multifaceted benefits of technology adaptation for MSMEs in Indonesia, ranging from operational efficiency improvements and expanded market reach to heightened innovation and resilience in the face of resource constraints. These findings emphasize the importance of fostering a technology-friendly environment to empower and sustain entrepreneurship in the MSME sector, thereby contributing to the economic vibrancy of Indonesia.

Environmental Policy and MSME

The positive impact observed in Indonesia's environmental policy aligns seamlessly with our initial expectations, emphasizing the crucial role of proactive policy frameworks in nurturing a conducive environment for Micro, Small, and Medium Enterprises (MSMEs) entrepreneurship. This alignment underscores a broader societal recognition of the paramount importance of integrating sustainable business practices (OECD). When exploring the potential benefits for MSMEs, the transformative power of environmental policy compliance becomes evident (Indrawati et al., 2023). Enhanced resource efficiency, a byproduct of adherence to these policies, not only contributes to environmental sustainability but also bolsters the economic viability of MSMEs. This, in turn, translates into tangible outcomes such as expanded market access, as consumers increasingly value businesses committed to sustainability, and a fortified market position through an enhanced reputation, potentially attracting socially conscious investors and partners (Permatasari & Gunawan, 2023).

Examining the mechanisms driving this positive impact reveals that MSMEs aligning with environmental policies tend to embrace superior business practices. Compliance acts as a catalyst for innovation, prompting businesses to seek more efficient and environmentally friendly solutions. For instance, the imperative to reduce carbon footprints may drive the adoption of green technologies, subsequently elevating overall operational efficiency. Compliance not only ensures adherence to regulations but also opens doors to various opportunities for MSMEs. Embracing green practices allows these enterprises to access new markets prioritizing sustainability, making partnerships with eco-conscious stakeholders more viable. Furthermore, achieving green certifications can serve as a potent marketing tool, differentiating MSMEs in the market and sharpening their competitive edge (Permatasari & Gunawan, 2023).

While the positive impact is discernible, MSMEs face inherent challenges in adapting to environmental policies. The initial costs associated with implementing sustainable practices may pose a formidable barrier, and a lack of awareness or understanding of the benefits may hinder widespread adoption. Recognizing these challenges is pivotal for crafting effective strategies to support MSMEs on their journey towards sustainability. Identifying collaboration opportunities emerges as an essential component in addressing these challenges, where governments, NGOs, and industry associations can play pivotal roles. Collaborative efforts may encompass capacity-building programs, financial incentives, and knowledge-sharing initiatives aimed at educating businesses on the advantages of environmental compliance (Permatasari & Gunawan, 2023). This study's positive impact aligns with and contributes to existing literature on the relationship between environmental policy and entrepreneurship,

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emphasizing the universality of this correlation. Furthermore, the study provides nuanced insights into the Indonesian MSME landscape, confirming established patterns while uncovering contextual factors specific to Indonesia. These nuanced insights contribute to a more comprehensive understanding of how environmental policy shapes entrepreneurship in diverse contexts.

Entrepreneurship of MSME and Their Success

In this section, we meticulously dissect the findings of our study, directing our focus toward examining the intricate relationship between entrepreneurship and the success of Micro, Small, and Medium Enterprises (MSMEs) in Indonesia. The overarching objective is to illuminate the profound and affirmative impact that entrepreneurship wields on the success trajectory of MSMEs within the unique Indonesian context. Our empirical results resoundingly affirm a positive and statistically significant relationship between entrepreneurship and MSME success. This substantiates the pivotal role played by entrepreneurial traits—namely innovation, risk-taking, and proactiveness—in shaping the destiny of MSMEs in Indonesia. Entrepreneurs endowed with these qualities are adept at navigating the challenges and uncertainties pervasive in the business landscape, thereby fostering heightened performance and success (Kurniawati & Setiawan, 2019).

A pivotal dimension of entrepreneurship instrumental in driving MSME triumph is innovation. Entrepreneurs actively immersed in innovative practices are apt to conceive and develop distinctive products, services, or business models finely attuned to the evolving needs of the market. The capacity to adapt to technological advancements and changing consumer preferences emerges as a hallmark of triumphant MSMEs operating within the dynamic Indonesian business milieu (Ulum et al., 2023).

Our study accentuates the pivotal role of market orientation and proactive strategies in entrepreneurial success. Entrepreneurs finely attuned to market dynamics, actively seeking avenues for growth, are strategically positioned to capitalize on emergent trends (Atuahene-Gima & Ko, 2001; Dzogbenuku & Keelson, 2019). Proactive approaches, encompassing effective marketing, strategic partnerships, and a commitment to continuous improvement, prove instrumental in both the realization and perpetuation of MSME success (Boso et al., 2012).

While entrepreneurship emerges as a formidable driver of MSME success, a holistic consideration of the broader context, notably the impact of environmental policy, becomes imperative (Singh et al., 2021). Entrepreneurs operating within an environment fostering sustainable and responsible business practices stand to gain additional benefits, ranging from an enhanced market reputation to heightened customer trust (Pangarso et al., 2022). Future research endeavors could delve deeper into the nuanced interplay between entrepreneurship, environmental policy, and the intricacies of MSME success.

Implication

The study's findings carry significant implications for various aspects of entrepreneurial development in Indonesia. In the realm of Human Resource Management (HRM), the positive and substantial impact observed underscores the need for entrepreneurs to embrace strategic HRM practices. This involves aligning HRM strategies with the unique needs and goals of MSMEs, emphasizing skill

development and training initiatives to empower the workforce in navigating the dynamic business landscape effectively.

Moreover, the study highlights the crucial role of Technology Adaptation in driving MSME entrepreneurship. Entrepreneurs should prioritize the integration of relevant technologies into their operations, and policymakers can support this by providing incentives and resources for technology adoption. The need for comprehensive digital literacy programs becomes apparent, ensuring that both entrepreneurs and employees possess the necessary skills to leverage technology for innovation and competitiveness.

Environmental Policy emerges as another critical factor positively influencing MSME entrepreneurship. Policymakers are encouraged to promote green entrepreneurship by implementing environmentally friendly policies and offering incentives for sustainable practices. Simultaneously, entrepreneurs should be aware of and comply with environmental regulations, and policymakers can facilitate this process by simplifying regulatory frameworks and providing guidance.

In a broader context, an integrated approach is essential, recognizing the interconnectedness of HRM, technology adaptation, and environmental policy. Entrepreneurs and policymakers alike are encouraged to adopt a holistic perspective that considers these factors collectively. Additionally, policy advocacy becomes crucial to ensuring that regulations and initiatives actively support the growth of MSMEs. Entrepreneurs and business associations should engage with policymakers, conveying the specific needs and challenges faced by MSMEs to shape future policies conducive to their development. By addressing these implications, entrepreneurs and policymakers can contribute to the sustained growth and success of MSMEs, fostering a resilient and innovative entrepreneurial landscape in Indonesia.

Limitation

While the study provides valuable insights into the positive and significant impacts of Human Resource Management, Technology Adaptation, and Environmental Policy on MSME Entrepreneurship in Indonesia, it is essential to acknowledge certain limitations. Firstly, the study's focus on a specific geographical context and industry may limit the generalizability of the findings. Future research could explore diverse industries and regions to obtain a more comprehensive understanding of the dynamics at play.

Another limitation pertains to the cross-sectional nature of the study, which captures a snapshot in time. Longitudinal studies could offer a more dynamic perspective, tracking changes and developments in the relationships between HRM, technology, environmental policy, and entrepreneurship over time. Additionally, the study predominantly relies on quantitative data, and incorporating qualitative research methods could provide richer insights into the nuanced factors influencing MSME entrepreneurship.

Future studies might delve deeper into the moderating factors that could influence the observed relationships. For instance, the impact of cultural nuances, government support mechanisms, and industry-specific dynamics could be explored to refine our understanding of the contextual factors shaping MSME entrepreneurship in Indonesia.

CONCLUSION

In conclusion, this study underscores the positive and significant impact of Human Resource Management, Technology Adaptation, and Environmental Policy on MSME Entrepreneurship in Indonesia. The findings highlight the importance of strategic HRM practices, technology integration, and environmentally conscious policies for fostering a conducive environment for MSME growth. However, it's important to acknowledge the study's limitations, including its specific focus on a particular industry and region, the cross-sectional nature of the data, and the predominantly quantitative approach. Future research should consider a more diverse range of industries and regions, adopt longitudinal and qualitative methods, and explore additional moderating factors to enhance our understanding of the complexities surrounding MSME entrepreneurship in Indonesia. Addressing these aspects will contribute to a more comprehensive and nuanced perspective, ultimately supporting the sustained development of MSMEs in the country.

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