Article

High-Involvement Human Resource Management Practices and Employee Resilience: The Mediating Role of Employee Technology Adaptation—A Case Study of South Sumatra

Afriyadi Cahyadi [1,*] , Taufiq Marwa [1], József Poór [2], Ahmad Maulana [1] and Katalin Szabó [3]

1   Faculty of Economics, University Sriwijaya, Indralaya 30662, Indonesia; taufiqmarwa@unsri.ac.id (T.M.);
     maulana25@unsri.ac.id (A.M.)
2   Doctoral School of Economics and Regional Sciences, Hungarian University of Agriculture and Life Sciences,
     H-2100 Gödöllő, Hungary; poor.jozsef@uni-mate.hu
3   Institute of Agricultural and Food Economics, Hungarian University of Agriculture and Life Sciences,
     H-2100 Gödöllő, Hungary; szabo.katalin@uni-mate.hu
*   Correspondence: afriyadicahyadi@fe.unsri.ac.id

Abstract: In the post-COVID-19 era, the need for a resilient workforce to maintain a competitive advantage has become increasingly critical. Despite advancements, there is a research gap in understanding how employee resilience is influenced by high-involvement human resource management practices and employee technology adaptation. This study addresses this gap by developing and empirically testing a mediation model linking to employee technology adaptation and resilience. Theoretical frameworks include the resource-based view, human co-adaptation, and positive organizational behavior. A cross-sectional survey of 322 employees from small and medium enterprises in South Sumatra was conducted. Structural equation modeling was used to analyze the mediating role of employee technology adaptation in the relationship between high-involvement human resource management practices and employee resilience. The results indicate that high-involvement human resource management practices positively affects both technology adaptation and resilience. Employee technology adaptation partially mediates this relationship. The findings offer practical insights for human resource managers, suggesting that fostering technology adaptation through high-involvement human resource management practices can enhance employee resilience. This study concludes with a discussion on the theoretical and practical implications contributing to the development of small and medium enterprises in the digital era post COVID-19.

Keywords: high-involvement human resource management practices; employee technology adaptation; employee resilience; post-COVID-19 era; small and medium enterprises

1. Introduction

Since the preceding years, transformative phenomena have been continuously reshaping human resource management systems globally. The COVID-19 pandemic has engendered an unprecedented array of disruptions, characterized by atypical organizational closures and a cascade of operational exigencies that were previously unanticipated within the contemporary business milieu (IMF 2021). Amidst this tumultuous landscape, employee resilience (ER) has emerged as an essential construct, serving as a pivotal determinant for organizations striving to navigate the sustained pressures and uncertainties precipitated by the pandemic. ER is critical for facilitating effective adaptation to the pervasive and often destabilizing changes within organizational systems and external business environments (Amir and Mangundjaya 2021). These disruptions have exacerbated stress, amplified risk, and intensified emotional challenges among employees (Braun et al. 2017; Aguiar-Quintana et al. 2021; Arokiasamy and Krishnaswamy 2021).

Furthermore, the pandemic has acted as a catalyst for the acceleration of transformative trends within the realm of human resource management, underscoring the imperative

for human resource practitioners to implement strategic frameworks that emphasize the cultivation of ER through empowerment (McKinsey & Company 2020). This paradigm shift necessitates a comprehensive and strategic approach to human resource management, focusing on the development of resilient personnel capable of withstanding and adapting to ongoing and emerging challenges (Ruck and Welch 2012). HIHRMPs have emerged as a critical mechanism for fostering ER (Wood and Wall 2007), particularly in the context of the intensified reliance on digital work environments that has become prominent in the aftermath of the COVID-19 crisis. Central to HIHRMPs is the enhancement of employee engagement, which functions as a significant predictor of various organizational outcomes and overall effectiveness (Harter et al. 2002).

Despite increasing dependence on digital technologies that necessitate high levels of resilience, there exists a discernible gap in the empirical literature regarding the interplay between HIHRMPs and ER. This absence highlights the necessity for rigorous scholarly investigation to elucidate the mechanisms through which high-involvement practices can be strategically employed to fortify ER within the contemporary digital and volatile work environment. Information technology fully enables human resource management practices after the successful adaptation of technology shifts their traditional ways (Bondarouk and Ruël 2009). As a result, companies must ensure that employees engage with ever-changing technology (Kee and Rubel 2021). Of course, human resource managers need to facilitate solid teamwork, adequate training and development, information sharing, and feedback to employees (Renkema et al. 2021). Since employee technology adaptation (ETA) is critical to ensure ER, this process calls for high employee involvement in performing work.

In the aftermath of the COVID-19 pandemic, small and medium enterprises (SMEs) have markedly intensified their engagement with communication technologies, capitalizing on the advanced competencies of employees in digital communication tools (Hasgall and Ahituv 2018). SMEs are recognized as vital economic engines across numerous countries. The interrelation between HIHRMPs and ER is fundamentally intertwined with ETA in operational contexts. Consequently, it is imperative for employees to proficiently integrate with systems that leverage state-of-the-art information and communication technologies. Despite the profound global implications of this phenomenon, there remains a conspicuous scarcity of empirical research addressing the intricate dynamics among HIHRMPs, ETA, and ER.

The enduring effects of the COVID-19 crisis could prove beneficial for SMEs. Managers within these organizations may come to recognize that digital transformation represents a viable solution for sustaining employee productivity in the post-crisis era. The inherent uncertainty associated with this transformation can be leveraged as a strategic advantage, fostering increased flexibility that in turn enhances work engagement. To restore organizational functions to their pre-crisis operational norms, managers need to rely on organizational resilience, which is fundamentally dependent on ER (Priyono et al. 2020).

Indonesia possesses substantial potential for advancing technology-based SMEs (Kurniawati et al. 2021). Of course, ETA is crucial for Indonesian SMEs to enhance their export competitiveness (Falentina et al. 2021). However, many of these enterprises face challenges due to limitations in internet access and low levels of digital literacy (Fachrunnisa et al. 2020). The exigencies imposed by the COVID-19 crisis have underscored the need for technological adaptation (Wiliandri 2020). This situation calls for scholarly investigation into how SME employees in Indonesia adopt technology and the positive relationship between such adoption and ETA and ER. South Sumatra, a province in Indonesia, exemplifies an area with significant potential for technological application among SMEs. This potential could be realized through digital marketing of products and services to international markets. Many SMEs are already supported by the internet and social media platforms in professional tasks. The integration of ETA in SMEs could enhance the value of products and services offered to global consumers and contribute to the region's cultural identity and local wisdom.

According to the 2022 report by Statistics Indonesia (BPS Provinsi Sumatera Selatan 2022), the annual survey conducted in 2020 on the SME sector recorded a total of 75,569 SMEs within South Sumatra. This substantial figure reflects the dynamic entrepreneurial ecosystem in the region, emphasizing the pivotal role that SMEs play in facilitating economic growth and generating employment opportunities. Notably, the food industry emerged as the predominant category, comprising 23,440 enterprises, thereby underscoring not only the region's rich culinary heritage but also escalating consumer demand for a diverse array of food products. Following the food sector, the textile industry and the non-metal minerals industry were identified as the second and third most prevalent categories, each with over 10,000 enterprises. This diversification across sectors signifies a resilient economic structure capable of adapting to varying market demands. In contrast, the paper and paper goods industry, along with the electrical equipment industry, recorded the fewest SMEs, with only one enterprise each. This disparity may indicate potential areas for development and investment, suggesting that these sectors could greatly benefit from strategic interventions aimed at enhancing their competitiveness and growth trajectories. Overall, the findings highlight the critical need for targeted policies and initiatives to further strengthen the SME sector, thereby fostering innovation and sustainability within the province's economic framework.

SMEs in South Sumatra have increasingly embraced a variety of technologies to enhance their operational efficiency and strengthen their competitive position. A notable technology utilized by these enterprises is Information and Communication Technology (ICT). SMEs leverage websites and e-commerce platforms for product marketing, thereby facilitating access to broader markets. Furthermore, the employment of social media as a promotional tool and a means of customer engagement has become increasingly prevalent, enabling SMEs to cultivate communities around their offerings.

In the production sector, numerous SMEs have integrated automated machinery and contemporary agricultural technologies. The incorporation of such machinery into production processes enhances operational efficiency and equips SMEs to address rising demand. Moreover, there is a growing trend in the implementation of management and accounting systems, which includes software for inventory management and financial reporting, in addition to Point of Sale (POS) systems that streamline sales transactions.

The adoption of digital payment technologies and online payment methods is also gaining momentum among SMEs. These technological innovations simplify transactional processes and improve customer convenience. Additionally, the integration of renewable energy technologies, such as solar power generation, empowers SMEs—particularly those located in remote areas—to reduce electricity costs and promote sustainability initiatives.

In addition to technology adoption, training and skill development programs are crucial components for success. Various institutions provide online training programs aimed at enhancing the competencies of SME owners and employees in digital marketing and the application of novel technologies. Product and process innovation remains a focal point, as SMEs continuously endeavor to develop new products that deliver increased value.

The theoretical frameworks of the Resource-Based View (RBV), human co-adaptation, and positivist organizational behavior collectively constitute a rigorous foundation for the exploration of HIHRMPs, ETA, and ER within organizational contexts.

The RBV posits that an organization's unique resources and capabilities are critical for attaining competitive advantage and enhancing performance outcomes. Through the strategic implementation of HIHRMPs, organizations not only foster employee development but also effectively leverage their human capital to drive superior performance outcomes (Huo et al. 2015). This perspective underscores the significance of internal resources, particularly human resources, as vital assets that contribute to organizational effectiveness and sustainable competitive advantage.

Concurrently, POB theory enriches this framework by positing resilience as a fundamental component of employee behavior within the workplace. POB highlights the importance of cultivating positive psychological attributes, such as optimism and resilience,

which can significantly enhance employee performance and overall well-being. This emphasis on positive behavioral attributes empowers organizations to create supportive environments that promote employee engagement and adaptability, thereby augmenting organizational resilience.

Additionally, the human co-adaptation theory elucidates the intricate dynamics between employees and technological innovations, delineating the processes through which employees adjust to new tools and systems. In an era of rapid technological advancement, comprehending the mechanisms of human co-adaptation is imperative. This theory accentuates the necessity for targeted training programs that equip employees with the requisite skills and competencies to thrive in technologically sophisticated environments (Alahmad and Robert 2021).

By synthesizing these theoretical frameworks, this research framework provides a comprehensive understanding of the interrelationships among HIHRMPs, ETA, and ER, thereby facilitating organizational adaptation and performance in an increasingly dynamic landscape. This multidimensional approach not only enriches the academic discourse but also offers practical insights for organizations seeking to enhance their human resource practices and cultivate a resilient workforce.

The present study aims to examine the causal relationship between HIHRMPs, ETA, and ER in the context of South Sumatra, Indonesia. Specifically, it addresses the question of whether HIHRMPs serve as a positive predictor of both ETA and ER, and whether ETA functions as a mediating variable through which HIHRMPs enhance ER. This scholarly work extends the existing body of literature by investigating previously explored relationships, such as those between human resource management and ER (Kim et al. 2022), and strategic human resource management practices and ER (Rehman et al. 2021). Additionally, it builds upon earlier studies examining the relationship between HIHRMPs and technology adaptation (Rubel et al. 2016), as well as the interplay between high-engagement work practices and technology adaptation (Rubel et al. 2020).

Subsequent to the introduction section, this article is structured into several key components: the literature review, which encompasses four distinct sections aligned with the proposed hypotheses; the methods section, consisting of three parts detailing the research design and analytical procedures; and the results and discussions section, which is divided into five segments that interpret and contextualize the findings. Ultimately, the final section presents a comprehensive conclusion, synthesizing the main insights and implications of the study.

2. Literature Review

SMEs have long been recognized as the cornerstone of industries and economies globally. These enterprises adopt cutting-edge technologies (Dressler and Paunovic 2021; Phayaphrom et al. 2021; Hanić et al. 2016), primarily by capitalizing on human resource management frameworks (Klepić 2021; Nam and Luu 2022) to facilitate the integration of Industry 4.0, thereby enhancing their competitiveness on the international stage (Saad et al. 2021a; Ciurea et al. 2021; Ayoko 2021; Das et al. 2020). The effective management of both human resources and technological innovations, as well as the comparison of innovative versus non-innovative firms and the identification of ER, are critical to the success of SMEs (Alberti et al. 2018). However, they often encounter significant constraints related to the quantity and quality of their human resources (Wuen et al. 2021). The extant literature indicates that SMEs frequently rely on informal and short-term human resource management practices (Li and Rees 2021).

In recent years, the resilience of SMEs has emerged as a critical concern within both academic scholarship and policy discourse (Saad et al. 2021b). The disruptions caused by the COVID-19 pandemic have further accentuated the imperative of strengthening SME resilience as they navigate the complexities of the post-pandemic era (Zutshi et al. 2021). Given the foundational role employees play in the effective implementation of ETA, and ER, their insights are indispensable for a comprehensive understanding of these interrelated

constructs. Figure 1 articulates the causal linkages between them, offering an integrative framework for exploring the dynamics at play.
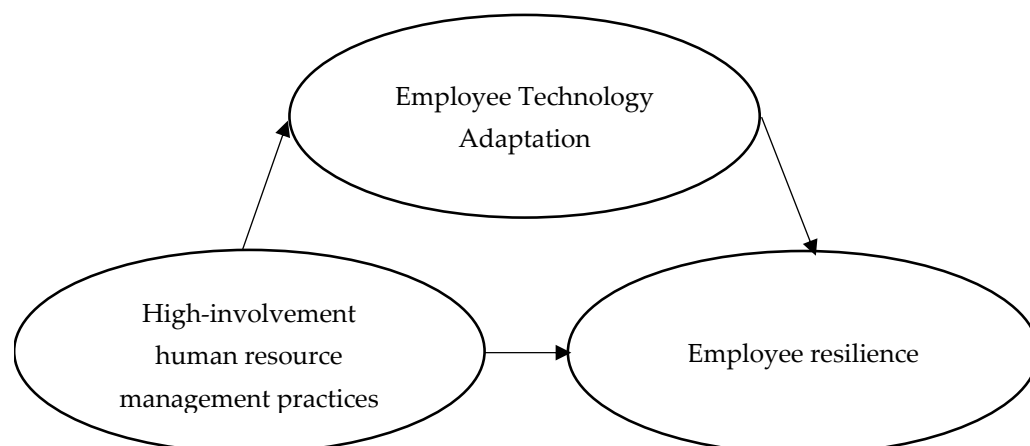
Figure 1. Research framework. (Source: authors' own research 2022).

2.1. High-Involvement Human Resource Management Practices and Employee Resilience

Research on human resource management during the COVID-19 pandemic has elucidated that the crisis markedly expedited the process of digital transformation, necessitating the adoption of innovative, adaptive, and secure solutions by organizations. The immediate transition to remote work underscored the paramount importance of fortifying IT infrastructure and information security. Consequently, the deployment of strategic human resource management practices to achieve ER has emerged as a rational and imperative measure. Such practices—encompassing employee empowerment, competency enhancement, information dissemination, recognition, equitable remuneration, and work engagement—are critical for navigating the adversities imposed by the pandemic and fostering a constructive organizational milieu (Maden 2015; Carvalho and Areal 2016). Despite these insights, the understanding of the nexus between human resource management and ER remains insufficiently developed.

HIHRMPs represent a deliberate approach to augmenting employee skills, motivation, and engagement (Siriyanun et al. 2019). These practices afford employees increased autonomy, valued knowledge, and more substantial contributions within their professional roles (Alikaj et al. 2020). Scholarly discourse has expounded on these practices using mechanisms such as mentoring, job rotation, training, and developmental opportunities (Wang and Shaheryar 2020), thereby enabling employees to exert influence over their own professional trajectories (Boxall and Huo 2021). The RBV theory posits that organizations invest in HIHRMPs to facilitate employee development and organizational advancement (Huo et al. 2015).

The integration of High-Involvement Work Systems (HIWS) into contemporary work environments has become increasingly prevalent. Both HIHRMPs and HIWS emphasize elements such as information technology, reward systems, developmental opportunities, autonomy, participation, empowerment, and recognition. The distinction between these two constructs lies in their scope and objectives: HIWS is oriented towards overall management, whereas HIHRMPs specifically target human resource management. The aim of HIWS is to enhance performance through proactive and adaptive approaches reflective of modern work requirements, whereas HIHRMPs are designed to develop employee skills and capabilities, thereby empowering them to shape their own futures (Boxall and Huo 2021). HIWS contributes to the development of employees' knowledge, skills, and abilities (Husseina and Çağlara 2019).

Empirical studies have investigated the relationship between HIHRMPs and ER. Kim et al. (2022) established a linkage between human resource management practices and ER, asserting that human resource strategies bolster ER in times of turbulence. Rehman

et al. (2021) identified that human resource management practices—including training, employee participation, job security, job descriptions, results-oriented assessments, internal career opportunities, and profit-sharing mechanisms—affect ER outcomes. Bardoel et al. (2014) demonstrated that human resource management practices enhance ER by fostering social support, work–life balance, employee assistance programs, development initiatives, flexible work arrangements, reward systems, occupational health and safety measures, risk management strategies, and diversity management.

Additional scholarly contributions supporting the relationship between HIHRMPs and ER include findings by Cooke et al. (2021), who examined employee involvement and ER; by Kumar and Kumar (2021), who explored e-training and ER; and by Janna et al. (2021), who investigated the effects of e-training and career development on ER. There is broad consensus among scholars that high-involvement work practices enhance competence, motivation, and skills, thereby reflecting ER (Li et al. 2022). Hence, HIHRMPs are posited as predictors of ER.

In the realm of organizational studies, resilience is conceptualized through POB theory, which addresses organizational complexity (Amir and Mangundjaya 2021). Psychologists define resilience as the capacity to adapt effectively to adversity (Bhandarkar and Jadhav 2022). The level of resilience during periods of crisis can significantly influence employee behavior (Leask and Ruggunan 2021), and effective resilience management can shape employee characteristics (Liang and Cao 2021). Resilience has been examined from various perspectives, including economic, psychological, and socio-ecological dimensions (Caniëls and Hatak 2022; Değirmenci 2022).

Furthermore, a scholarly consensus on the relationship between human resource management and ER remains inconclusive (Danaeefard et al. 2022). ER is characterized as employees' ability to leverage organizational support to utilize resources constructively and adapt intelligently to volatile work environments (Mehmood and Saeed 2021). Resilient employees demonstrate an ability to recover from crises (Isidro and Calleja 2021). Braun et al. (2017) delineated steps for achieving ER, including adaptation to new methodologies, shifting directions and situations, experimentation, and the exploration of novel approaches. Consequently, business management can enhance ER by offering flexible work arrangements (Kumar and Das 2022).

Hypothesis 1: *High-involvement human resource management practices positively affect employee resilience.*

2.2. High-Involvement Human Resource Management Practices and Technology Adaptation

Technological advancements have catalyzed significant acceleration across various global sectors (Alsamydai 2014). This evolutionary process affords considerable benefits to organizations (Markopoulos et al. 2020). Innovations in information technology have facilitated the capacity for employees to engage in virtual work, transcending traditional spatial and temporal limitations (Raghuram et al. 2019). Such engagement necessitates a high degree of digital adaptability from employees (Davison and Ou 2017). Recent technological advancements have markedly enhanced the efficacy of virtual work environments (Asatiani and Penttinen 2019). Indeed, technological innovations in human resource management have revolutionized work processes, rendering them more efficient, accurate, timely, and unrestricted (Choochote and Chochiang 2015).

Human co-adaptation theory elucidates the processes through which employees adapt to technological innovations (Alahmad and Robert 2021). The integration of contemporary technology into everyday life is influenced by a complex interplay of social, psychological, and economic factors (Ejdys and Halicka 2018). To ensure social sustainability, individuals must effectively adapt to evolving information technologies (Bala and Venkatesh 2016). Technological adaptation involves an evaluative framework addressing both the contextual and substantive dimensions of technology (Lyon et al. 2016). This framework constitutes a

facet of innovation that affects employee behavior on cognitive, affective, and psychometric levels (Ramdhani et al. 2017).

Rubel et al. (2016) conceptualized HIHRMPs through components such as competency development, empowerment, equitable remuneration, information dissemination, and recognition. They further identified a research gap concerning the linkage between high-involvement work practices and TA at the individual organizational level (Rubel et al. 2020). HIHRMPs significantly influence employee attitudes toward learning, knowledge sharing, and technological utilization. Effective TA is contingent upon human facilitation, as specified by HIHRMPs (Cardy and Miller 2003).

HIHRMPs and HIWS are aligned in their orientation (Vazquez-Bustelo and Avella 2019). HIWS and high-involvement work practices are often used interchangeably (Kilroy et al. 2017). HIWS is characterized as a comprehensive management orientation aimed at enhancing employee involvement in workforce development (Elorza et al. 2022). This system encompasses a set of practices requiring alternative job design strategies, such as establishing communication channels to relay pertinent information to employees (Turner and Cross 2018). It is associated with key elements such as authority, information, rewards, knowledge, autonomy, and relational aspects (Afshan et al. 2021), and is pertinent to technology adaptation through attributes including participation in decision-making, access to task-relevant information, necessary training, rewards for decision-making involvement, and information sharing (Malik and Mudrifah 2020; Chênevert et al. 2016). HIWS facilitates employees in enhancing their sense of belonging and engagement in continuous improvement processes (Camuffo et al. 2017). The objective of HIWS is to foster optimal performance through proactive and adaptive responses to contemporary job requirements (Shah et al. 2021). Consequently, a high-involvement human resource management approach can enhance ETA.

Hypothesis 2: *High-involvement human resource management practices positively affect employee technology adaptation.*

2.3. Employee Technology Adaptation and Employee Resilience

In 2019, the global landscape witnessed a notable decline in productivity and output, concomitant with an increase in labor redundancy, attributable to the COVID-19 pandemic (Aca and Bassey 2021). The contemporary technological milieu is characterized by the assimilation of advanced technologies, substantial investments, technology transfer mechanisms, and the pivotal role of individuals as users (Das et al. 2020). Information technology has facilitated enhanced collaborative efforts and effective performance assessment during periods of crisis. To cultivate workplace resilience, employees are required to possess advanced technical competencies and demonstrate active engagement with technological tools.

While the discourse surrounding technology has been firmly established in both academic and professional domains, recent crises have significantly reconfigured the relationship between technology adaptation and ER in an unprecedented manner. The escalated reliance on technological solutions during this period has not only transformed operational dynamics but has also fostered a more conducive and supportive work environment (Stec et al. 2020). This evolution underscores the urgent need for the development of effective employee resilience strategies to adeptly navigate the complexities of contemporary challenges.

The implementation of advanced technologies—particularly through the utilization of electronic human resource management systems—necessitates specific technological competencies from employees, which reside within the broader framework of human resource management. Empirical research has established a clear correlation between the deployment of such systems and the enhancement of employee resilience, as evidenced by studies conducted by Al-kasasbeh et al. (2016) and Kumar and Kumar (2021). The influence of technological capabilities on employee resilience is well documented, indicating that

the proficient application of technology serves as a critical determinant of resilience in the workplace (Bustinza et al. 2019). Furthermore, the pervasive integration of technology has emerged as a crucial factor contributing to the overall resilience of organizations and their workforce (Hite and McDonald 2020).

In conclusion, it is increasingly evident that the proactive adoption of technology by employees not only facilitates the improvement of operational efficiency but also plays a significant role in reinforcing employee resilience. This observation highlights the necessity of aligning technological integration with strategic initiatives aimed at fostering resilience within organizational contexts.

Technology adaptation is conceptualized as the intentional modification of existing conditions to achieve operational alignment, utilizing various strategies such as workflow redesign, comprehensive user training, and ongoing maintenance of technology (Yen et al. 2017). This integrative approach is imperative for organizations aiming to enhance their efficiency and effectiveness in an increasingly dynamic technological landscape.

Research indicates that employees exhibiting high levels of resilience are significantly less susceptible to feelings of inferiority within their work environments, which can detrimentally impact their overall performance and psychological well-being (De Clercq et al. 2021). It is important to recognize that resilience is not solely an individual attribute; it is profoundly influenced by organizational culture and support systems that cultivate a sense of belonging and confidence among employees.

Moreover, technology adaptation is regarded as a strategic decision that focuses on the implementation of innovative methodologies. This perspective underscores the proactive role of organizations in leveraging technological advancements to facilitate growth and maintain a competitive advantage (Ramdhani et al. 2017). Such strategic decisions require a nuanced understanding of both the technological landscape and the human factors involved, as the successful adaptation of technology is contingent upon the effective synergy between technological resources and the workforce.

Indeed, the interaction between technology adaptation and employee resilience is critical for organizations navigating the complexities of contemporary business environments. By fostering a flexible technological framework and enhancing resilience among employees, organizations can establish a strong foundation for sustained success.

Hypothesis 3: *Employee technology adaptation positively affects employee resilience.*

2.4. Moderation of Employee Technology Adaptation

Investigating the moderating role of ETA within the framework of HIHRMPs and ER necessitates an integration of prior scholarly insights regarding these constructs. In this context, ETA has been conceptualized both as a consequence of HIHRMPs and as a predictor of ER, thereby serving a mediating function in the relationship between HIHRMPs and ER.

The foundational step in this analysis is informed by extant research elucidating the impact of HIHRMPs on ER. Pertinent studies include Kim et al. (2022), Bardoel et al. (2014), and Cooke et al. (2021), which explored the dynamics between human resource management practices and ER. Complementary research by Rehman et al. (2021) examined strategic human resource management and ER, while Janna et al. (2021) and Kumar and Kumar (2021) investigated the influence of human resource management practices, such as e-training and career development, on ER. Li et al. (2022) contributed by analyzing the relationship between high-involvement work practices and ER.

The subsequent phase involved reviewing empirical evidence on how HIHRMPs influence technology adaptation. Studies by Rubel et al. (2016) and Rubel et al. (2020) substantiated the link between high-involvement work practices and technology adaptation at the individual level within organizational contexts. Further elucidation was provided by Malik and Mudrifah (2020), who explored the relationship between HIWS and technology adaptation.

Finally, a body of research established a direct correlation between technology adaptation and ER. For instance, Al-kasasbeh et al. (2016) demonstrated a linkage between technological application and ER, while Kumar and Kumar (2021) affirmed the association between e-human resource management and ER. Bustinza et al. (2019) highlighted the influence of technological capabilities on resilience, and Hite and McDonald (2020) underscored how increased technology use and its impact on skills and work demand resilience. Synthesizing these research trajectories, it is posited that ETA mediates the relationship between HIHRMPs and ER.

Hypothesis 4: *Employee technology adaptation mediates the relationship between high-involvement human resource management practices and employee resilience.*

3. Methods

3.1. Measures

The present quantitative study employed a multi-item scale survey with a response continuum ranging from '1' (strongly disagree) to '7' (strongly agree). The constructs of HIHRMPs and ETA were operationalized using items adapted from Rubel et al. (2016). Each construct—encompassing competency development, empowerment, equitable rewards, information dissemination, and recognition—was represented by a single item, yielding a total of five items. For example, one item stated, "Formal training and competency development activities are available in my organization".

ETA was measured using five distinct items designed to capture various dimensions of technology engagement, including technological proficiency, familiarity with technology, adaptability to technological changes, precision in technology usage, and the frequency of technology application. An illustrative item is "I have skillfully utilized the tools and applications provided by new technology".

ER was assessed through nine items derived from the established scale developed by Näswall et al. (2015). This scale evaluates dimensions such as effective collaboration, management of high workloads, crisis resolution, learning from errors, performance re-evaluation, effective response strategies, seeking assistance, engaging with managerial personnel, and handling organizational change. For instance, one item reads, "I effectively collaborate with others to manage unforeseen challenges at work".

Data collection was facilitated through an online questionnaire administered via Google Forms. The survey instrument was disseminated online to participants via two widely utilized communication platforms in South Sumatra, specifically Facebook Messenger and WhatsApp. The distribution was carried out both individually and within group contexts to maximize respondent reach. Prior to the dissemination, the target respondents were carefully selected; they were employees of SMEs operating within the South Sumatra region. The participants were provided with clear instructions to complete the questionnaire and were subsequently encouraged to forward the survey link to other potential participants within their network. This approach was designed to leverage snowball sampling, thereby enhancing the diversity and quantity of respondents by capitalizing on personal networks and group dynamics.

3.2. Samples and Procedures

This research study aimed to collect data from employees of SMEs located in South Sumatra, Indonesia over the period from August to November 2022. The data collection utilized a snowball sampling methodology, which facilitated the identification and recruitment of participants through referrals within their professional networks. Accompanying the questionnaire was a detailed cover letter that articulated the study's objectives and significance, thereby providing potential respondents with a comprehensive understanding of its aims.

The cover letter also assured participants of their anonymity and confidentiality, emphasizing that their responses would be securely stored and would not be linked to

their identities. Moreover, it underscored the voluntary nature of participation, informing respondents that they could withdraw from the study at any time without facing any adverse consequences.

Additionally, the cover letter provided explicit information regarding the estimated time commitment required to complete the questionnaire, thereby enabling informed consent. The participants were afforded the flexibility to commence the survey at their convenience during the data collection phase. To further enhance communication and accessibility, the research team included contact information, allowing the participants to inquire about any aspects of the questionnaire or the data collection process. This comprehensive approach was designed to foster trust and engagement among the respondents, ultimately contributing to the robustness of the data collected.

By participating in the survey, the respondents provided explicit informed consent, thereby indicating their understanding of the study's objectives and their rights as participants. To comply with ethical standards, it was stipulated that respondents be at least 18 years of age. Furthermore, robust measures were implemented to ensure the confidentiality of personal information. This included stringent protocols to protect sensitive data, such as names, email addresses, and phone numbers, thereby guaranteeing that such information remained confidential and was not disclosed without explicit consent. These practices were designed to uphold the ethical integrity of the research process while fostering trust and safeguarding the rights of all participants involved.

This study employed a cross-sectional survey methodology, comprising a sample of 322 employees from SMEs in South Sumatera. The predominant proportion of respondents in this study comprised male participants, constituting 71.43% of the total sample. The majority of respondents were aged between 21 and 30 years (34.16%) or between 31 and 40 years (27.33%). The predominant educational qualification among the respondents was senior high school (56%), and a substantial proportion possessed 6 to 10 years of professional experience (32%). Notably, a significant percentage of the respondents were employed in SMEs located outside of the capital city of Palembang (83%). Furthermore, 485 (the majority) of the respondents were engaged in merchandise-focused SMEs, such as souvenir shops, while 73% (the majority of this group) were employed in SMEs that specialize in goods rather than services.

3.3. Analysis

This quantitative study employed an explanatory approach to analyze the data and test the hypotheses. Structural equation modeling (SEM) was utilized as a robust analytical framework to systematically examine and substantiate the complex relationships among the independent, mediating, and dependent variables in this study. This methodology was executed in a stepwise manner, ensuring both the validity and reliability of the results. The first stage entailed conducting confirmatory factor analysis (CFA), which was used to assess the measurement model by validating that the observed indicators accurately reflected the latent constructs, thus confirming the construct validity of the variables under scrutiny. Following this, a thorough evaluation of the goodness of fit was performed, employing a set of fit indices, including the Chi-Square statistic, root mean square error of approximation (RMSEA), comparative fit index (CFI), and Tucker–Lewis index (TLI), to verify how well the model fit the empirical data. The next step involved applying the structural equation modeling process to explore both the direct and indirect relationships among the variables, allowing for the estimation of the magnitude and direction of these relationships. In the final stage, hypothesis testing was conducted to assess the statistical significance and effect size of the proposed relationships, thus providing rigorous empirical evidence to substantiate the theoretical model. This comprehensive and methodologically rigorous approach facilitated a deeper understanding of the underlying mechanisms and interdependencies within the model, offering valuable insights into the causal processes that drive the observed phenomena.

The data analysis was performed with Microsoft Excel, the Statistical Package for the Social Sciences (SPSS), and Analysis of Moment Structures (AMOS). Initially, the data were organized in Microsoft Excel to create a dataset, which was then imported into SPSS and analyzed using AMOS. AMOS facilitated the description of all variables (both latent and manifest) and their interrelationships via path diagrams. This tool is commonly used in studies with datasets of 200 or more observations.

Prior to conducting the three stages of analysis, the authors tested for Common Method Bias (CMB) using SPSS. CMB was assessed to determine whether variation in respondents' answers was attributable to the instrument rather than actual respondent tendencies. The CMB value was found to be 42.76%, which is below the threshold of 50%, indicating no significant bias.

4. Results and Discussion

4.1. Confirmatory Factor Analysis

The initial stage of the analytical process involved conducting confirmatory factor analysis (CFA) on the comprehensive model. According to the results presented in Table 1, the construct validity of all items was substantiated, as evidenced by the critical ratio values, which exceeded the critical threshold of 1.96, and p-values of 0.000. These findings confirm that the items met the stringent criteria for statistical significance, thereby affirming their validity within the model.

Table 1. Construct validity.

Variables	Item	Critical Ratio	Probability
High-involvement human resource management practices	Competency development		
	Empowerment	9.768	0.000
	Fair rewards	10.974	0.000
	Information sharing	9.833	0.000
	Recognition	11.238	0.000
Employee technology adaptation	Technology skills		
	Technology familiarity	9.713	0.000
	Technology adjusting	10.978	0.000
	Technology accuracy	9.826	0.000
	Technology frequency	11.230	0.000
Employee resilience	Effective collaboration		
	Resolving crises	10.369	0.000
	Managing high workloads	5.071	0.000
	Learning from mistakes	10.402	0.000
	Re-evaluating performance	10.140	0.000
	Effective response	10.948	0.000
	Seeking assistance	10.706	0.000
	To approach managers	10.797	0.000
	Using change	10.676	0.000

Source: authors' own research (2022).

However, a subsequent analysis detailed in Table 2 reveals that within the framework of convergent validity testing, one item among the original 19—specifically item Y2.2 (pertaining to the management of high workload)—did not satisfy the necessary validity criteria. This item was characterized by a factor loading of 0.297, which is notably below the acceptable threshold for convergent validity. This deviation from the threshold indicates that item Y2.2 did not contribute meaningfully to the construct being measured and, as a result, it was deemed invalid.

Regarding this finding, item Y2.2 was excluded from the analytical process, leading to a revised set of 18 items for subsequent examination. This adjustment ensured that only items meeting the rigorous standards of validity were included in the partial model analysis, thereby enhancing the robustness and reliability of the findings.

Table 2. Convergent validity.

Variable	Item	Factor Loadings
High-involvement human resource management practices	Competency development	0.616
	Empowerment	0.753
	Fair rewards	0.658
	Information sharing	0.626
	Recognition	0.654
Employee technology adaptation	Technology skills	0.675
	Technology familiarity	0.594
	Technology adjusting	0.681
	Technology accuracy	0.598
	Technology frequency	0.695
Employee resilience	Effective collaboration	0.658
	Managing high workloads	0.297
	Resolving crises	0.639
	Learning from mistakes	0.621
	Re-evaluating performance	0.683
	Effective response	0.666
	Seeking assistance	0.670
	To approach managers	0.664
	Using change	0.689

Source: authors' own research (2022).

Further validation of convergent validity is demonstrated in Table 3, which provides the values from the sample covariance matrix, ranging from 3.343 to 4.378. These values were significantly higher than the adjacent values both to the left and below in the matrix, indicating that the 18 items exhibited superior convergent validity. This elevated covariance further substantiates that the items measured the same underlying construct effectively. In conclusion, this comprehensive analysis affirms that the 18 items were both valid and reliable for use in the subsequent hypothesis testing, thereby ensuring the robustness and credibility of the subsequent analytical results.

Table 3. Sample covariance.

Item	X5	X4	X3	X2	X1	Y2.9	Y2.8	Y2.7	Y2.6	Y2.5	Y2.4	Y2.3	Y1.1	Y1.5	Y1.4	Y1.3	Y1.2	Y1.1
X5	3.666																	
X4	1.427	3.343																
X3	1.610	1.359	3.641															
X2	1.636	1.889	1.806	3.765														
X1	1.529	1.268	1.416	1.727	3.481													
Y2.9	1.599	1.608	1.733	2.093	1.728	3.959												
Y2.8	1.505	1.152	1.573	1.812	1.697	1.708	3.531											
Y2.7	1.509	1.532	1.491	1.925	1.433	1.538	1.881	3.699										
Y2.6	1.697	1.610	1.726	2.007	1.428	1.804	1.812	1.767	4.029									
Y2.5	1.619	1.251	1.464	1.849	1.372	2.006	1.595	1.898	1.807	3.672								
Y2.4	1.779	1.321	1.510	1.841	1.465	1.751	1.373	1.487	1.614	1.634	4.064							
Y2.3	1.427	1.412	1.734	1.651	1.225	1.782	1.627	1.435	1.526	1.724	1.704	3.803						
Y2.1	1.690	1.604	1.765	1.735	1.338	1.760	1.429	1.576	1.459	1.588	1.738	1.721	3.813					
Y1.5	1.672	1.623	1.724	1.959	1.341	1.999	1.671	1.502	1.608	1.678	1.605	1.656	1.795	3.851				
Y1.4	1.842	1.309	1.474	1.530	1.317	1.431	1.707	1.684	1.818	1.675	1.093	1.665	1.633	1.574	4.378			
Y.1.3	1.399	1.364	1.625	1.968	1.502	1.674	1.684	1.673	1.839	1.709	1.711	1.592	1.516	1.839	1.609	3.591		
Y1.2	1.517	1.232	1.354	1.500	1.161	1.209	1.366	1.620	1.626	1.426	1.762	1.542	1.553	1.826	1.734	1.370	4.030	
Y1.1	1.564	1.372	1.427	1.790	1.405	1.891	1.407	1.915	1.716	1.934	1.565	1.639	1.886	1.858	1.689	1.507	1.612	3.885

Source: authors' own research (2022).

The CFA applied to the partial model, which comprised a total of 18 items, rigorously validated these items with respect to both construct and convergent validity. The findings,

as delineated in Table 4, reveal that all critical values fell within the range of 9.512 to 11.230, substantially exceeding the critical threshold of 1.96. This indicates that the observed values were statistically significant, affirming that each item effectively contributed to the construct under investigation. Furthermore, all associated *p*-values were recorded as 0.00, well beneath the conventional alpha level of 0.05, thereby substantiating the statistical significance of each item and its role in the model.

Table 4. Standardized regression.

Variable	Item	Critical Ratio	Probability
High-involvement human resource management practices	Competency development		0.000
	Empowerment	10.965	0.000
	Fair rewards	9.887	0.000
	Information sharing	9.512	0.000
	Recognition	9.838	0.000
Employee technology adaptation	Technology skills		0.000
	Technology familiarity	9.713	0.000
	Technology adjusting	10.978	0.000
	Technology accuracy	9.826	0.000
	Technology frequency	11.230	0.000
Employee resilience	Effective collaboration		0.000
	Resolving crises	10.369	0.000
	Learning from mistakes	10.085	0.000
	Re-evaluating performance	10.936	0.000
	Effective response	10.697	0.000
	Seeking assistance	10.781	0.000
	To approach managers	10.655	0.000
	Using change	11.050	0.000

Source: authors' own research (2022).

Detailed validation is further provided in Table 5, which outlines the factor loadings for each item, ranging from 0.591 to 0.755. These values exceeded the minimum threshold of 0.5, signifying that each item demonstrated a robust relationship with its corresponding latent factor. This strong correlation reinforced the construct validity of the model. Additionally, the composite reliability (CR) values, ranging from 0.78 to 0.88, surpassed the requisite threshold of 0.6, indicating that the items exhibited high reliability in measuring their intended constructs. Although the Average Variance Extracted (AVE) values ranged from 0.39 to 0.44, which is below the ideal threshold of 0.5, they were still considered acceptable. This is due to the CR values being consistently above the minimum threshold, thereby ensuring that the overall reliability of the model was not undermined by the lower AVE values.

Table 5. Reliability.

Variable	Item	Factor Loadings	Composite Reliability	Average Extracted Variance
High-involvement human resource management practices	Competency development	0.615		
	Empowerment	0.755		
	Fair rewards	0.659	0.80	0.44
	Information sharing	0.627		
	Recognition	0.652		
Employee technology adaptation	Technology skills	0.675		
	Technology familiarity	0.591		
	Technology adjusting	0.682	0.78	0.42
	Technology accuracy	0.598		
	Technology frequency	0.695		

Table 5. *Cont.*

Variable	Item	Factor Loadings	Composite Reliability	Average Extracted Variance
Employee resilience	Effective collaboration	0.656	0.88	0.39
	Resolving crises	0.639		
	Learning from mistakes	0.619		
	Re-evaluating performance	0.685		
	Effective response	0.668		
	Seeking assistance	0.672		
	To approach managers	0.665		
	Using change	0.690		

Source: authors' own research (2022).

4.2. Goodness of Fit and Structural Equation Modeling

The output of the Goodness-of-Fit (GoF) analysis provided compelling evidence that the model employed in this study is highly suitable for the application of structural equation modeling (SEM) hypothesis testing procedures. The Chi-Square Minimum Discrepancy (CMIN) was reported as 204.075, with the model having 132 degrees of freedom (df). Consequently, the CMIN/df ratio was calculated to be 1.546, which is substantially below the critical threshold of 2.0. This result indicates that the model demonstrates a satisfactory fit with the empirical data, thereby suggesting an adequate representation of the underlying structural relationships.

In addition to the CMIN/df ratio, several other fit indices further validated the model's adequacy. The Goodness-of-Fit Index (GFI) was measured at 0.937, exceeding the conventional benchmark value of 0.9, thereby signaling a robust fit between the model and the observed data. The Incremental Fit Index (IFI) was reported as 0.971, and the Tucker–Lewis Index (TLI) was 0.966. Both indices surpassed the critical threshold of 0.9, indicating a high level of model fit and suggesting that the model effectively captures the complexities of the data structure.

Furthermore, the root mean square error of approximation (RMSEA) was calculated at 0.041, which is well below the recommended upper limit of 0.08. This low RMSEA value signifies minimal approximation error, reinforcing the notion that the model provides an accurate representation of the underlying structural relationships.

4.3. Hypotheses

The results derived from the analysis involving 13 validated items and the fitted model are detailed in Table 6. This table presents the critical ratio values for the three direct relationships under investigation: 2.043, 9.564, and 2.232. Each of these values surpassed the critical threshold of 1.96, which is indicative of statistical significance. This suggests that each direct relationship was robust and significantly different from zero. Additionally, the associated probability values for these relationships were recorded as 0.041, 0.000, and 0.026, respectively, all of which fall below the standard significance level of 0.05. These results collectively confirm that Hypotheses 1–3 were supported, as their *p*-values were sufficiently low to reject the null hypothesis in each case.

Table 6. Hypotheses.

Hypothesis	Effect Value	Critical Ratio	Probability	Decision
1	0.485	2.043	0.041	Accepted
2	0.946	9.564	0.000	Accepted
3	0.529	2.232	0.026	Accepted
4	0.501	-	-	Accepted

Source: authors' own research (2022).

Moreover, Hypothesis 4, which examines the indirect relationship resulting from the combination of Hypotheses 2 and 3, was also supported by the data. The indirect relationship value was 0.501, which is notably higher than the value observed for Hypothesis 1. This indicates that the indirect pathway has a substantial impact and enhances our understanding of the overall model. In terms of the direct relationships, the recorded values were 0.485, 0.946, and 0.529, with Hypothesis 2 demonstrating the highest value of 0.946. This suggests that Hypothesis 2 had the most significant direct effect among the hypotheses tested.

The analysis further revealed that the total effect, which combines both direct and indirect relationships between HIHRMPs and ER, was 0.986. This total effect was calculated by summing the effects of Hypothesis 1 and Hypothesis 4. The high total effect value underscores the comprehensive influence of both direct and indirect pathways in explaining the relationship between HIHRMPs and ER. These findings provide a thorough understanding of how HIHRMPs impact ER and illustrate the significant role of both direct and indirect effects in shaping this relationship. The extensive validation of these hypotheses supports the robustness of the model and affirms its utility in exploring the dynamics of HIHRMPs and their impact on ER.

Figure 2 presents the output from AMOS, which includes the analysis of 322 recursive samples. This graphical representation, in conjunction with the fit indices, provides further confirmation of the model's appropriateness and reliability for hypothesis testing. Collectively, the evidence from these fit indices and the graphical output substantiates the model's robustness and ensures its suitability for the planned hypothesis testing procedures, thus validating its capacity to deliver credible and meaningful insights within the scope of this research.
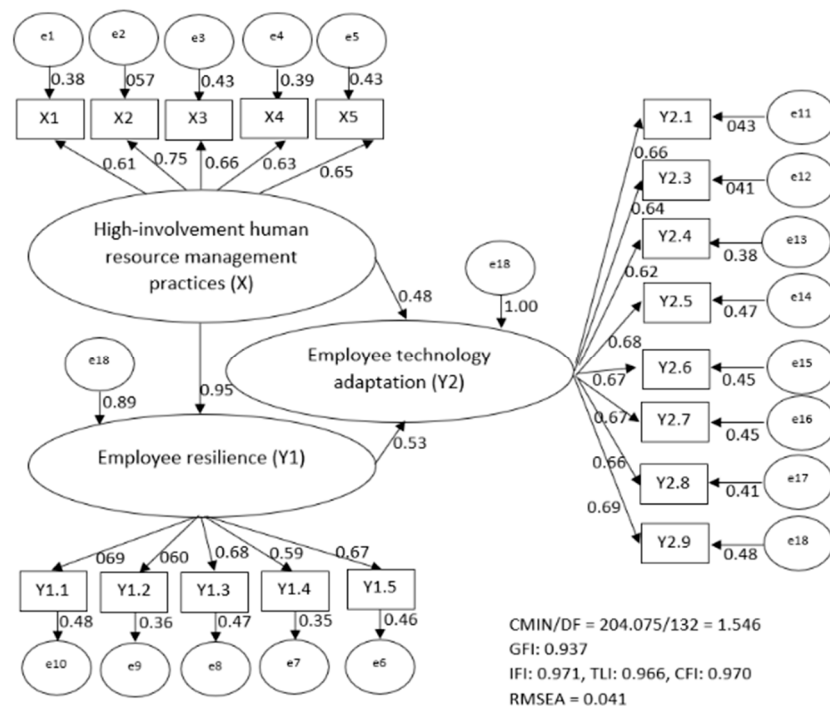

Figure 2. The output of AMOS. (Source: authors' own research 2022).

4.4. Discussion

This study identified and delineated two primary predictors of ER: HIHRMPs and ETA. HIHRMPs were classified as an independent predictor, whereas ETA functioned as a mediating variable in this model. The empirical findings revealed that the relationship between HIHRMPs and ER was significantly augmented through the mediation of ETA. Specifically, the association between HIHRMPs and ETA demonstrated a higher magnitude

than the direct and indirect relationships between HIHRMPs and ER, as well as between ETA and ER. The comprehensive total effect, integrating both direct and indirect pathways of HIHRMPs on ER, was found to be the most substantial. These results align with contemporary scholarly perspectives that emphasize the transformative impact of technology adaptation on traditional human resource management practices (Bondarouk and Ruël 2009), underscore the critical role of ER in fostering organizational resilience (Priyono et al. 2020), and highlight how modern enterprises have navigated the complexities introduced by the COVID-19 pandemic (Amir and Mangundjaya 2021).

The findings of this study elucidate that HIHRMPs influence ER through both direct and indirect channels, with ETA serving as a significant mediator. As HIHRMPs intensify, there is a concomitant increase in ETA, which in turn enhances ER. Notably, the indirect effect of HIHRMPs on ER, mediated by ETA, exhibits greater significance compared to the direct effect of HIHRMPs on ER. This mediation effect of ETA is thus pivotal in amplifying the relationship between HIHRMPs and ER. These insights are supported by the extant literature, including research by Kim et al. (2022), which established a positive relationship between human resource management and ER; by Rehman et al. (2021), which explored the linkage between strategic human resource management practices and ER; by Rubel et al. (2016), which investigated the association between high-involvement human resource management and technology adaptation; by Rubel et al. (2020), which related high-engagement work practices to technology adaptation; by Bardoel et al. (2014), which identified that human resource management practices positively influence ER; by Cooke et al. (2021), which discussed the relationship between human resource management practices and employee involvement and ER; by Kumar and Kumar (2021), which examined the correlation between e-training and ER; by Janna et al. (2021), which connected e-training and career development to ER; and by Li et al. (2022), which demonstrated that high-involvement human resource practices enhance workplace competence, motivation, and skills, thereby reflecting ER.

Furthermore, the study identified and elaborated on five dimensions of HIHRMPs and five dimensions of ETA, corroborating the findings of Rubel et al. (2016). The dimensions of HIHRMPs encompass competency development, empowerment, equitable rewards, information sharing, and recognition. Conversely, the dimensions of ETA include technology skills, technology familiarity, adaptation to technology, technological accuracy, and frequency of technology use. The eight dimensions of ER are based on the well-established scale proposed by Näswall et al. (2015), which includes effective collaboration, crisis resolution, learning from errors, performance re-evaluation, effective response, seeking assistance, approaching managers, and employing change. However, the dimension of managing high workloads, as included by Näswall et al. (2015), was not supported by the present study.

The analysis of the factor loadings indicates that within HIHRMPs, the dimension of empowerment is the most salient determinant of both ETA and ER. Among the dimensions of ETA, the frequency of technology use emerged as the most significant predictor of ER. Additionally, the dimension of managing change within ER is predominantly influenced by HIHRMPs and ETA. These dimensions are critical in understanding the intricate relationship between HIHRMPs, ETA, and ER.

Incorporating perspectives from European countries and the United States offers valuable insights into the broader applicability of these findings. Research in European contexts, for example, has demonstrated a strong correlation between high-involvement HR practices and employee engagement, particularly in nations with robust labor regulations that promote worker participation (Brewster et al. 2016). In countries such as Germany and the Netherlands, where stakeholder involvement in organizational decision-making is common, HIHRMPs are associated with heightened employee morale and resilience, further reinforcing the importance of adopting such practices in SMEs.

Furthermore, studies conducted in the U.S. emphasize how technology adoption can enhance organizational agility and employee resilience, especially in sectors that are experiencing rapid technological change (Appelbaum et al. 2000). The integration of HIHRMPs

and ETA is reflected in the evolving labor markets of both regions, where organizations increasingly recognize the necessity of empowering employees and facilitating their adaptation to new technologies. For instance, in the technology sector, firms that prioritize employee engagement and technology training are more likely to retain talent and foster innovative capabilities, thereby improving overall performance.

These dynamics underscore the global relevance of the relationship between HIHRMPs, ETA, and ER. As organizations across Europe and America face challenges associated with globalization and digital transformation, the importance of cultivating a resilient workforce becomes increasingly apparent. HRM managers who leverage high-involvement practices and promote technological adaptation not only enhance individual employee resilience but also fortify the organization's capacity to respond to environmental uncertainties and competitive pressures.

Modern human resource management strategies, characterized by an emphasis on empowerment and frequent use of technology, are integral to enhancing ER in both local and global contexts. By acknowledging and incorporating these cross-cultural dimensions, HRM managers can optimize organizational outcomes and bolster resilience, thereby positioning their organizations for sustained growth in an increasingly dynamic environment. Future research should explore these relationships further, potentially examining industry-specific variations and longitudinal impacts across diverse geographical settings to fully understand the complexities of employee resilience in an interconnected world.

4.5. Managerial Implications

The COVID-19 pandemic has starkly illuminated the exigency for amplified resilience among SMEs within the contemporary economic and social milieu. This unprecedented global health crisis has introduced a spectrum of complex and intricate challenges for human resource managers within these enterprises, necessitating a comprehensive reassessment of managerial strategies and an adaptive management paradigm. In this framework, employees have emerged as pivotal to HIHRMPs, ETA, and ER. The efficacy of these practices is profoundly contingent upon employees' perceptions and responses, which have become critical determinants of organizational effectiveness and resilience.

Effective management of human resources in conjunction with technological advancements is paramount. It is imperative for managers to exhibit a sophisticated understanding of the differentiation between innovative and traditional practices to optimize ER and enhance workforce performance. Human resource managers within SMEs are tasked with ensuring that employees not only engage with but also exhibit proficiency in adapting to rapidly evolving technological landscapes. This necessitates a multi-faceted approach that includes fostering cohesive and collaborative teamwork, implementing robust and continuous training and development programs, facilitating dynamic information sharing processes, and providing timely and constructive feedback.

In addressing the challenges imposed by the COVID-19 crisis, SMEs have increasingly integrated a diverse range of communication technologies. This strategic adaptation has been supported by employees' growing competence in utilizing digital applications for effective communication. The assimilation of these technological innovations has facilitated substantial enhancements in work procedures, making them more streamlined, accurate, and timely and less encumbered by traditional operational constraints.

Technological advancements have engendered rapid progress across various sectors globally, presenting significant opportunities for SMEs. Innovations in information technology have fundamentally transformed the paradigms of employee interaction, enabling virtual collaboration across geographically dispersed locations and time zones. Engaging in digital work requires that SME employees demonstrate a high degree of digital adaptability and proficiency. Recent developments in information technology have further augmented the efficacy of virtual work arrangements, thereby providing SMEs with a strategic advantage in navigating the complexities of the modern business environment.

Strategic incorporation of these technological advancements, coupled with a concerted effort to cultivate a digitally proficient workforce, is crucial for SMEs seeking to enhance their organizational resilience and achieve sustained competitive advantage. By aligning their human resource management practices with evolving technological capabilities, SMEs can effectively address the current exigencies and position themselves for enduring success and operational excellence within the increasingly digitalized business landscape.

5. Conclusions

Mediation of the relationship between HIHRMPs and ER by ETA significantly amplifies the direct association between HIHRMPs and ER, highlighting the essential role of technological advancements in enhancing ER. This study provides an exploration of how ER can be fostered within SMEs through the intricate interplay between technological innovations and HIHRMPs. As current research progressively investigates the dynamics among HIHRMPs, ETA, and ER, it becomes evident that a sophisticated understanding of these interactions is crucial for comprehending their impact on organizational effectiveness.

Ongoing global challenges, particularly those magnified by the COVID-19 pandemic, underscore the necessity for a comprehensive examination of the interrelationships among HIHRMPs, ETA, and ER practices. These research findings indicate that addressing the enduring effects of the pandemic requires the strategic application of HIHRMPs, ETA, and ER. The integration of these elements not only advances theoretical knowledge in the domains of human resource management, information technology, and organizational behavior, but also offers a practical framework that supports the development and adaptation of SMEs in the evolving digital landscape post COVID-19.

This study provides pioneering insights into the interrelations of HIHRMPs, ETA, and ER; however, it is subject to several notable limitations that warrant consideration. Firstly, the data collection period was constrained to approximately two months. Extending the duration of data collection could potentially yield more robust and comprehensive results, including enhanced AVE values. A prolonged data collection period would enable a more thorough examination of the variables and provide a more accurate representation of their relationships.

Secondly, the geographical scope of the research was limited to South Sumatra, which constrains the generalizability of the findings to SMEs in other regions of Indonesia. Regional variations in economic conditions, cultural contexts, and business practices may influence applicability of the results to other areas. Future research should aim to broaden the geographic scope to include a diverse range of locations, thereby enhancing the generalizability and relevance of the findings across different regional contexts.

Thirdly, the research model did not incorporate organizational culture as a potential moderating variable between the independent and dependent variables. Organizational culture plays a critical role in shaping both human resource management practices and ER and could provide valuable insights into how these relationships are moderated.

The organizational culture prevalent within SMEs can differ significantly from that found in larger corporations, reflecting distinct values, beliefs, and practices that influence their operational frameworks. Moreover, cultural variances across provinces in Indonesia may further exacerbate these dynamics, thereby affecting not only the organizational culture but also the human resource practices employed within these entities. Notably, SMEs are inclined to implement less formalized and more adaptable human resource management strategies compared to their larger counterparts, which may have implications for the execution of HIHRMPs, ETA, and ER. Consequently, future research should integrate organizational culture as a moderating variable to comprehensively elucidate its influence on the interrelationships among HIHRMPs, ETA, and ER, thereby enhancing our understanding of how contextual cultural factors shape HR practices within SMEs in Indonesia.

This study is limited to an article written in late 2024, although the findings were derived in 2022. We have chosen to present the results of this research at this juncture

because we contend that they remain highly relevant to ongoing discourse—particularly in the post-COVID-19 era—concerning human resource management (HRM) and the integration of technology within workplace contexts. The decision to withhold these findings from presentation between 2022 and 2024 was guided by our commitment to rigorously enhance the quality of our manuscript.

This study is constrained to an analysis of the specific sectors of SMEs under investigation. Nevertheless, the respondents encompass a diverse range of sectors across the manufacturing, services, and trade domains.

In conclusion, while this study contributes valuable theoretical and practical insights into the roles of HIHRMPs, ETA, and ER within the context of SMEs, addressing these limitations and expanding research efforts in these areas will further enhance the understanding of these complex relationships and their implications for organizational resilience and development in the digital era.

By implementing targeted strategic initiatives, HRM managers in SMEs can substantially enhance ER through the effective integration of technological adaptation and HIHRMPs. In the context of SMEs, where resource constraints are prevalent and adaptability is paramount, HRM managers should prioritize the establishment of an organizational environment that incentivizes employees to embrace technological innovations while actively participating in decision-making processes.

This proactive strategy will not only equip employees with essential competencies and confidence to navigate technological transitions but also cultivate a sense of ownership and engagement that is critical in smaller organizational frameworks. By emphasizing high-involvement practices—such as participatory training and transparent communication channels—HRM managers can foster a culture in which employees perceive themselves as valued and supported in their roles.

Consequently, this integration will engender a more adaptable and resilient workforce, which is indispensable for SMEs operating within competitive and often volatile markets. A resilient workforce is better positioned to address challenges, adjust to change, and leverage new technologies effectively, ultimately resulting in enhanced operational efficiency and innovation.

Moreover, these efforts will significantly contribute to overall organizational effectiveness, as a resilient workforce not only drives productivity but also strengthens the organization's capacity to fulfill its strategic objectives. Thus, HRM managers in SMEs can exert a profound influence on organizational success by fostering a culture characterized by resilience, adaptability, and engagement, thereby positioning their enterprises for sustainable growth in an increasingly dynamic environment.

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