

## **DEVELOPING A HUMAN RESOURCE DEVELOPMENT MODEL FOR WOMEN ENTREPRENEURS IN INDONESIAN MSMEs**

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### **ABSTRACT**

*Women entrepreneurs in Indonesia hold a pivotal role in national economic resilience, yet they face complex structural and managerial challenges amidst post-pandemic digital transformation. While previous studies have addressed isolated aspects such as financial literacy or digital transformation, there is a significant research gap regarding a comprehensive framework that integrates human resource strategies with digital and psychological dimensions. This study aims to develop a Collaborative Human Resource Development (HRD) Ecosystem Model tailored for women-led MSMEs. Employing a qualitative integrative literature review approach, this study synthesizes findings from recent scholarly publications indexed in reputable academic databases. The literature was selected based on predefined inclusion criteria focusing on women entrepreneurship, human resource development, digital transformation, and MSME development. The results formulate a model consisting of four integrated dimensions: (1) Entrepreneurial competency development; (2) Digital capability enhancement encompassing fintech and digital banking adoption; (3) Collaborative social and institutional support systems to mitigate dual-role barriers, and; (4) adaptive leadership and entrepreneurial resilience strengthening. The model emphasizes that successful digital transformation requires not only technical proficiency but also psychological readiness and supportive institutional ecosystems. Theoretically, this study bridges the gap between HRD and women's entrepreneurship literature in an emerging economy context. Practically, it provides a strategic roadmap for policymakers and financial institutions to design holistic empowerment programs that move beyond basic literacy toward sustainable digital ecosystem integration.*

*Keywords: human resource development; women entrepreneurs; collaborative ecosystem; digital transformation; entrepreneurial resilience*

### **INTRODUCTION**

Micro, Small, and Medium Enterprises (MSMEs) play a strategic role in the Indonesian economy through employment generation, poverty reduction, and strengthening

national economic resilience (Gunawan, 2025). Women entrepreneurs have become dominant actors in the MSME sector, contributing significantly to household welfare, regional economic

development, and social empowerment (Awalia et al., 2025). However, despite their substantial contribution, women entrepreneurs in Indonesian MSMEs continue to face critical barriers that hinder business sustainability and competitiveness (Setyaningrum et al., 2023).

The rapid development of digital technology and business transformation after the COVID-19 pandemic have forced MSMEs to adapt to digital ecosystems (Judijanto et al., 2024). Women entrepreneurs are increasingly required to possess digital literacy, financial capability, innovation skills, and adaptive leadership to survive in competitive markets (Yuniarti, 2024). Nevertheless, many women entrepreneurs still experience limitations in accessing training, technology adoption, and institutional support. (Awalia et al., 2025)

Research indicates that digital literacy and financial literacy significantly influence MSME performance among women entrepreneurs (Yuniarti, 2024). Studies emphasize that marketing capability, access to capital, and digital literacy are important determinants in

improving the competitiveness of women entrepreneurs (Pakpahan, 2025). Additionally, women entrepreneurs face psychological and socio-cultural constraints, including dual roles between domestic responsibilities and business management (Wardani, 2025).

The challenge of digital transformation has increased the urgency of developing adaptive human resource strategies for women entrepreneurs (Ayyasi & Maelani, 2024). Research demonstrates that entrepreneurial competencies, including business skills, management, and conceptual understanding, are crucial for MSME success (Gunartin et al., 2023). Furthermore, sustainable business practices and digital capability enhancement have become essential for women-led MSMEs (Huang et al., 2025).

Previous studies have examined women entrepreneurship from fragmented perspectives. Yuniarti, (2024) emphasized the role of financial literacy and human resource quality in supporting MSME digitalization, while Judijanto et al., (2024) focused on digital transformation and innovation as drivers of MSME competitiveness.

Gunartin et al., (2023) highlighted entrepreneurial competency as a key determinant of SME success, whereas

Wardani (2025) stressed the importance of communication and institutional support in empowering

**Table 1. Comparison of Existing Frameworks and Proposed Model**

Framework	Main Focus	Limitation	Contribution of CHEM Model
Human Capital Theory	Skills and knowledge	Ignores ecosystem support	Integrates institutional support
Social Capital Theory	Networks and relationships	Limited HRD perspective	Integrates HRD and digital capability
Digital Entrepreneurship Framework	Technology adoption	Weak leadership dimension	Includes adaptive leadership
Women Entrepreneurship Models	Gender barriers	Fragmented approach	Provides integrated ecosystem model

Women-led MSMEs. Although these studies provide valuable insights, they largely address these dimensions separately and do not explain how competency development, digital capability, institutional support, and adaptive leadership interact within an integrated HRD framework.

Therefore, there remains a significant research gap regarding integrated HRD models specifically designed for women entrepreneurs in Indonesian MSMEs. This study aims to develop a robust Collaborative Human Resource Development Ecosystem Model (CHEM) for women entrepreneurs in Indonesian MSMEs using an integrative literature review approach.

Accordingly, this study seeks to answer the following research question: How can an integrated Human Resource Development ecosystem model be developed to support sustainable women entrepreneurship development in Indonesian MSMEs?

The proposed model addresses existing conceptual gaps by integrating entrepreneurial competency development, digital capability enhancement, collaborative institutional support, and adaptive leadership strengthening to provide a strategic roadmap for targeted and sustainable empowerment programs.

The novelty of this study lies in the development of a Collaborative Human

Resource Development Ecosystem Model that integrates four interconnected dimensions: entrepreneurial competency, digital capability, collaborative institutional support, and adaptive leadership into a single conceptual framework for women-led MSMEs.

Unlike previous studies that examine these dimensions independently, the proposed model explains their interrelationships and collective contribution to sustainable women entrepreneurship development.

## **LITERATURE REVIEW**

Human Resource Development (HRD) is a strategic approach for improving organizational capability, productivity, innovation, and business sustainability (Pajri, 2024). In the context of MSMEs, HRD focuses not only on employee development but also on entrepreneurial competency, enhancement, adaptability, leadership capability, and continuous learning (Pakpahan, 2025). MSMEs generally operate with limited resources, making human capital one of the most critical determinants of business sustainability and competitiveness (Tjahjadi et al., 2024).

Research demonstrates that HRD strategies have a positive impact on increasing MSME competence, expanding markets, and strengthening competitiveness (Pakpahan, 2025). The study emphasized that skills training, marketing digitalization, and cross-sector collaboration are essential components of effective HRD programs. However, challenges such as lack of digital literacy and limited training access remain significant obstacles (Pakpahan, 2025).

Studies indicate that the quality of human resources in MSMEs requires creativity, innovation, adaptability to new technology, digital skills, and high entrepreneurial spirit (Yuniarti, 2024). Effective HRD enables entrepreneurs to improve strategic decision-making and business resilience amid economic uncertainty, particularly in the digital era where automation and artificial intelligence become increasingly prevalent. (Cosa & Torelli, 2024).

## **Women Entrepreneurship in Indonesian MSMEs**

Women entrepreneurs have become important drivers of Indonesia's economic growth, contributing significantly to

employment generation, family welfare improvement, and regional economic development. (Awalia et al., 2025). Women entrepreneurs are commonly involved in sectors such as culinary businesses, fashion industries, handicrafts, and home-based enterprises (Gunawan, 2025).

Research found that entrepreneurial competencies, including business skills, management, human relations, conceptual understanding, and attitude, are crucial to the success of women-led MSMEs (Gunawan, 2025). The study highlighted that developing these competencies can lead to more competitive and sustainable businesses, ultimately contributing to national economic growth.

However, women entrepreneurs still face various challenges, including limited access to capital, low digital literacy, socio-cultural barriers, and weak institutional support (Muyideen Awolaja et al., 2025). Research shows that while women entrepreneurs can sustain themselves through various economic conditions, there are significant weaknesses, particularly in financial management and marketing (Awalia et al., 2025).

Women entrepreneurs often experience dual responsibilities between domestic roles and business management, limiting participation in entrepreneurial training, networking, and business expansion activities (Wardani, 2025). Therefore, empowerment strategies should integrate social support, adaptive learning, and institutional collaboration (Rahindra & Wisnujati, 2024).

### **Digital Transformation and Competency Development**

Digital transformation has significantly changed the business environment, requiring MSMEs to adapt to digital ecosystems (Judijanto et al., 2024). The rapid growth of e-commerce, digital marketing, financial technology, and social media platforms provides new opportunities for MSMEs to expand markets and improve business efficiency (Gao et al., 2023). Research indicates that digital transformation and innovation significantly improve competitive advantage and MSME performance (Judijanto et al., 2024).

Digital capability enables entrepreneurs to improve customer engagement, market access,

innovation, and operational effectiveness. (Cosa & Torelli, 2024). However, many women entrepreneurs still experience limitations in digital adoption due to low digital literacy and limited technological access.

Studies emphasize that human resource competency challenges in the digital era require organizations to provide training, continuous development, and create work climates that foster innovation (Ayyasy & Maelani, 2024). Financial literacy also plays an important role in encouraging MSME digitalization, requiring entrepreneurs to have financial knowledge related to money management, performance assessment, budgeting behavior, and future planning (Yuniarti, 2024).

Communication plays a multidimensional role in empowering women-led MSMEs, serving as an integrated mechanism that supports market expansion, entrepreneurial identity formation, decision making, capacity building, and business resilience (Wardani, 2025).

### **Collaborative Ecosystem and Institutional Support**

Sustainable women entrepreneurship requires a comprehensive ecosystem approach involving multiple stakeholders (Awalia et al., 2025). Research emphasizes that implementing comprehensive strategies and policies including education and training in entrepreneurship, enhancing marketing support, leveraging technology and e-commerce, improving financial literacy, increasing access to capital, and creating stronger social networks, will help balance personal and professional responsibilities (Awalia et al., 2025).

MSMEs play a crucial role in achieving sustainability goals through innovation, collaboration, and appropriate policy support (Gunawan, 2025). Strategic efforts such as adopting sustainable business practices, leveraging modern technologies, and enhancing capacity through training are essential to strengthening MSMEs' contributions to sustainability.

Based on previous literature, women entrepreneurship development requires an integrated approach

involving competency enhancement, digital empowerment, social support systems, and adaptive leadership strengthening (Awalia et al., 2025). This study proposes a Collaborative Human Resource Development Ecosystem Model that integrates four interconnected dimensions: (1) Entrepreneurial competency development; (2) Digital capability enhancement; (3) Collaborative social and institutional support systems, and; (4) Adaptive leadership and entrepreneurial resilience strengthening.

The model emphasizes collaborative learning, mentoring systems, institutional networking, and digital empowerment as strategic approaches to strengthening women-led MSMEs in Indonesia, addressing existing conceptual gaps in the integration of HRD and women entrepreneurship perspectives (Meranti et al., 2025).

## **RESEARCH METHOD**

This study employed a qualitative research approach using an integrative literature review method to develop a Collaborative Human Resource Development (HRD) Ecosystem

Model for women entrepreneurs in Indonesian MSMEs. The integrative literature review approach was selected because it enables comprehensive synthesis of contemporary theories, empirical findings, and conceptual frameworks related to women entrepreneurship, human resource development, and MSME empowerment (Awalia et al., 2025).

The implementation of this study was conducted through several systematic stages, including literature identification, data collection, data classification, analysis, and conceptual model formulation. The study focused on understanding critical barriers and opportunities experienced by women entrepreneurs in Indonesia, particularly regarding competency development, digital transformation, institutional collaboration, and entrepreneurial resilience (Wardani, 2025).

## **Research Design**

This research used a qualitative descriptive design through an integrative literature study approach. The integrative literature review method was chosen because it allows researchers to synthesize various scientific perspectives and empirical

findings from previous studies to formulate a robust conceptual model that addresses existing conceptual gaps (Pakpahan, 2025). The study emphasized conceptual analysis and theoretical integration rather than statistical measurement.

The qualitative approach is appropriate for this study because the research aims to explore complex phenomena, identify recurring themes, and develop a comprehensive HRD model based on theoretical and empirical evidence from contemporary literature (Ayyasy & Maelani, 2024). This approach enables the integration of multiple perspectives on women entrepreneurship development in emerging economy contexts.

### **Data Sources and Literature Search Strategy**

The data used in this study were secondary data obtained from various scientific and academic sources related to women entrepreneurship, MSMEs, human resource development, digital transformation, and entrepreneurial empowerment.

Literature searches were conducted in Scopus, Google Scholar, SINTA, and Crossref databases within

the last five years Government reports and policy documents regarding MSME development Publications focusing on digital transformation and entrepreneurial competency development.

The selected literature focused on issues related to women entrepreneurs in MSMEs Riska (Awalia et al., 2025), entrepreneurial competency and business skills (Gunartin et al., 2023), digital literacy and financial literacy (Yuniarti, 2024), communication and empowerment processes (Wardani, 2025), HRD strategies and MSME performance (Pakpahan,2025), and sustainable entrepreneurship ecosystems (Haryati et al.,2022).

### **Data Collection Technique**

Data collection was conducted using systematic documentation and literature tracing techniques, following the content analysis approach used in recent MSME studies (Pakpahan, 2025). The researcher systematically searched and identified relevant references using keywords such as “human resource development” and “MSME” competitiveness (Pajri, 2024), “women entrepreneurs” and empowerment strategies (Awalia et al.,

2025), “digital transformation” and “entrepreneurial competency” (Judijanto et al., 2024), “collaborative ecosystems” and institutional support (Gunawan, 2025). Boolean operators (AND, OR) were used to refine the search process. The literature selection process used inclusion criteria to ensure relevance and quality, following systematic review protocols demonstrated in contemporary studies (Yuniarti, 2024).

**Table 2: Inclusion–Exclusion Criteria**

Inclusion Criteria	Exclusion Criteria
Peer-reviewed journal articles	Conference papers
Published 2020–2025	Duplicates
English or Indonesian	Non-academic sources
Women entrepreneurship/MSMEs	Unrelated topics

Selected 15 articles met the following criteria published within the last five years (2020 - 2025), relevant to women entrepreneurship, HRD, or MSME development, published in reputable journals indexed in SINTA or Scopus, discussed digital transformation, entrepreneurial competency, or collaborative support systems. Each article was evaluated

based on relevance to women entrepreneurship development, methodological rigor, publication quality, and contribution to HRD theory and practice.

### Data Analysis Technique

The data analysis process used qualitative content analysis techniques, following the systematic approach demonstrated in recent literature reviews (Ayyasy & Maelani, 2024). The collected literature was analyzed systematically to identify patterns, concepts, relationships, and recurring themes related to women entrepreneurship development. The stages of analysis included data reduction in which the researcher selected and simplified relevant information from the collected literature according to the research objectives, focusing on HRD strategies and women entrepreneurship development (Pakpahan, 2025). Subsequently, the data were categorized into four major themes that formed the foundation of the proposed model. These themes included entrepreneurial competency (Gunartin et al., 2023), digital capability (Yuniarti, 2024), institutional support

(Wardani, 2025), and adaptive leadership (Awalia et al., 2025). From the reviewed literature, recurring themes were identified through thematic analysis. These recurring themes were then synthesized into four interconnected dimensions forming the Collaborative HRD Ecosystem Model. The four dimensions were selected because they consistently emerged

across the reviewed literature and demonstrated strong theoretical and practical relevance to women entrepreneurship development. The next stage involved theme interpretation, where the researcher interpreted relationships among identified themes to understand major

**Table 3. Literature Synthesis Supporting the Collaborative HRD Ecosystem Mode**

Author	Main Findings	Emerging Theme	Contribution to Model
Gunartin et al., (2023)	Entrepreneurial skills determine MSME success	Entrepreneurial Competency	Dimension 1
Yuniarti (2024)	Digital literacy accelerates MSME competitiveness	Digital Capability	Dimension 2
Wardani (2025)	Institutional communication supports women entrepreneurs	Institutional Support	Dimension 3
Awalia et al. (2025)	Leadership resilience supports sustainability	Adaptive Leadership	Dimension 4
Judijanto et al., (2024)	Digital transformation requires ecosystem support	Integrated Ecosystem	Model Integration

Factors influencing women entrepreneurship development, drawing from multiple theoretical perspectives (Judijanto et al., 2024). Following the interpretation stage, a conceptual synthesis was conducted by integrating various theories and empirical evidence from the reviewed literature. Various theories and empirical findings were integrated to

formulate a comprehensive HRD framework, addressing gaps identified in previous research (Haryati et al.,2022). Based on the results of the synthesis, the study formulated a Collaborative Human Resource Development Ecosystem Model consisting of four interconnected dimensions that emphasize synergy between digital transformation and inclusive institutional support.

The four dimensions emerged repeatedly across the reviewed literature and were subsequently integrated into a unified HRD ecosystem framework.

### **Research Implementation Approach**

The implementation approach emphasized conceptual development through integrative literature-based analysis, following successful model development approaches in recent MSME studies (Gunawan, 2025). The proposed model provides a strategic roadmap for practical empowerment strategies, including: (1) Comprehensive Training Programs: Entrepreneurship training, digital literacy development, and financial literacy education based on identified competency gaps (Yuniarti, 2024); (2) Collaborative Mentoring Systems: Multi-stakeholder mentoring involving universities, government institutions, financial institutions, and business communities to strengthen entrepreneurial capability (Wardani, 2025); (3) Digital Ecosystem Integration: Encouraging women entrepreneurs to utilize digital platforms, e-commerce, and financial technology for improved

competitiveness and market expansion (Judijanto et al., 2024).

Through these implementation approaches, the proposed Collaborative HRD Ecosystem Model is expected to provide targeted and sustainable empowerment programs that move beyond basic literacy toward comprehensive digital ecosystem integration for women-led MSMEs in Indonesia.

### **RESULT AND DISCUSSION**

The results of this study were obtained through integrative literature analysis focusing on women entrepreneurs in Indonesian MSMEs. The analysis identified critical barriers, strategic empowerment needs, and formulated a Collaborative Human Resource Development (HRD) Ecosystem Model that addresses existing conceptual gaps. The discussion integrates contemporary empirical findings, theoretical perspectives, and practical implications for women entrepreneurship development in Indonesia.

### **Critical Barriers Faced by Women Entrepreneurs in Indonesian MSMEs**

The integrative literature analysis reveals that women entrepreneurs in Indonesia continue to face multidimensional barriers that affect business sustainability and competitiveness (Awalia et al., 2025). These barriers encompass entrepreneurial competency limitations, digital capability gaps, financial constraints, and socio-cultural challenges that require comprehensive intervention strategies.

Research demonstrates that many women entrepreneurs operate with limited managerial knowledge and restricted access to entrepreneurial training (Awalia et al., 2025). This condition significantly affects business planning, financial management, market expansion, and innovation capability (Gunartin et al., 2023). The findings indicate that while women entrepreneurs can sustain themselves through various economic conditions, there are significant weaknesses,

particularly in financial management and marketing capabilities.

Digital transformation presents substantial challenges for women entrepreneurs who continue to experience low digital literacy and limited capability to utilize digital platforms, e-commerce systems, and financial technology (Yuniarti, 2024). Studies show that MSME actors are required to have digital skills, adaptability to new technology, and have a high entrepreneurial spirit to deal with automation and artificial intelligence in the digital era. However, the lack of digital literacy and limited training access remain significant obstacles to digital adoption (Pakpahan, 2025).

Women entrepreneurs also face unique socio-cultural barriers, including dual responsibilities between domestic activities and business management, which limit their participation in professional development programs and networking activities (Wardani, 2025).

**Table 4. Main Challenges Faced by Women Entrepreneurs in Indonesian MSMEs**

<b>Model Dimension</b>	<b>Main Focus</b>	<b>Implementation Strategy</b>
Entrepreneurial Competency Development	Managerial skills, innovation, financial literacy	Training, workshops, mentoring
Digital Capability Enhancement	Digital literacy and technology adoption	Digital training and e-commerce assistance
Collaborative Institutional Support	Networking and partnership systems	Government, university, and community collaboration
Adaptive Leadership and Resilience	Leadership and psychological resilience	Leadership development and coaching

Research emphasizes that communication plays a multidimensional role in empowering women-led MSMEs, serving as an integrated mechanism that supports market expansion, entrepreneurial identity formation, and capacity building.

**Collaborative HRD Ecosystem Model Formulation**

Based on the integrative analysis, this study formulates a Collaborative Human Resource Development Ecosystem Model specifically designed for women entrepreneurs in Indonesian MSMEs. The model addresses existing conceptual gaps by integrating human resource strategies with digital and psychological dimensions, moving beyond isolated

approaches that focus only on specific aspects such as financial literacy or digital transformation. The model emphasizes that successful digital transformation requires not only technical proficiency but also psychological readiness and supportive institutional ecosystems (Ayyasy & Maelani, 2024). Unlike previous models, this framework emphasizes the synergy between digital transformation and inclusive institutional support to foster MSME sustainability (Judijanto et al., 2024).

The Collaborative HRD Ecosystem Model recognizes that effective human resource management is essential to improve MSME competitiveness (Pajri, 2024). The model integrates multiple stakeholder

involvement, including government agencies, educational institutions, financial institutions, and business communities, to create a comprehensive support system for women entrepreneurs (Gunawan, 2025).

**Table 5. Digital Capability and Its Contribution to Women-Led MSMEs Model Dimensions and Integration**

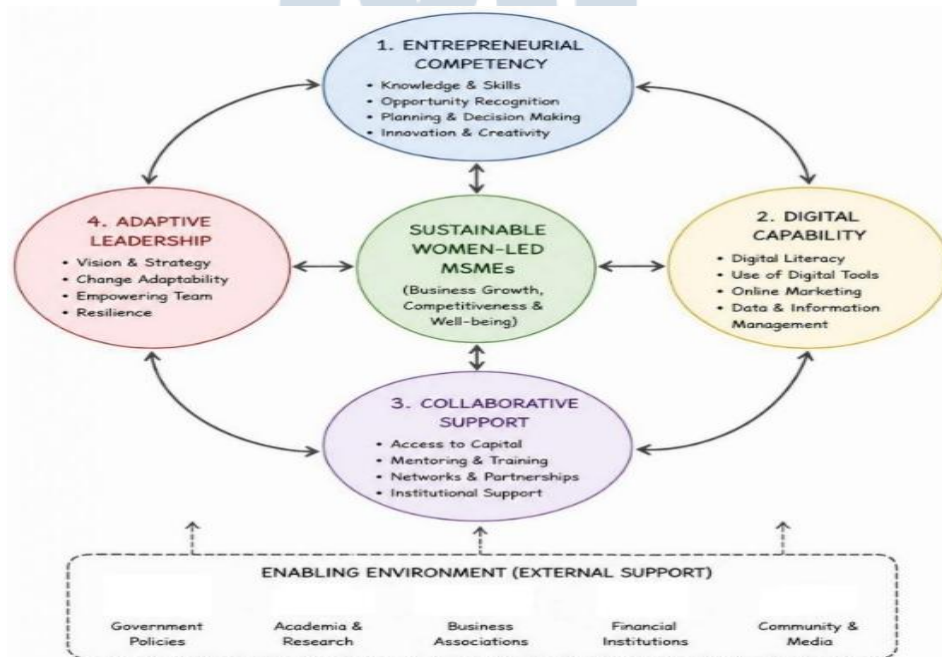
Digital Capability	Function	Business Contribution
Digital Marketing	Product promotion through social media and marketplaces	Increased market expansion
E-Commerce Utilization	Online product transactions	Increased sales opportunities
Digital Financial Systems	Digital payment and book keeping systems	Improved financial management
Online Communication	Customer relationship management	Improved customer engagement
Data-Based Decision Making	Market trend analysis	Better business strategies

The Collaborative HRD Ecosystem Model consists of four interconnected dimensions that work synergistically to strengthen women entrepreneurship development: (1) Entrepreneurial Competency Development: This dimension focuses on enhancing business skills, management capabilities, human relations, conceptual understanding, and entrepreneurial attitudes (Gunartin et al., 2023). Research demonstrates that entrepreneurial competencies are crucial to SME success, and developing these competencies can lead to more competitive and sustainable businesses. The dimension emphasizes continuous learning and

skill enhancement to improve decision-making capability, innovation, and business resilience; (2) Digital Capability Enhancement: This dimension addresses the critical need for digital literacy and technology adoption among women entrepreneurs (Yuniarti, 2024). The enhancement encompasses financial technology adoption, digital banking utilization, e-commerce platform usage, and digital marketing capabilities. Studies indicate that financial literacy plays an important role in encouraging MSME digitalization, requiring entrepreneurs to have comprehensive financial knowledge and digital behavior management; (3) Collaborative Social

and Institutional Support Systems: This dimension emphasizes the importance of multi-stakeholder collaboration in creating supportive ecosystems for women entrepreneurs (Wardani, 2025). The system integrates communication mechanisms, mentoring programs, institutional networking, and community-based support to address dual-role barriers and strengthen entrepreneurial agency. Research shows that communication within empowerment programs facilitates learning and motivation while community-based communication provides collective support; (4)

Adaptive Leadership and Entrepreneurial Resilience Strengthening: This dimension focuses on developing psychological capital, adaptive capacity, and leadership effectiveness among women entrepreneurs (Awalia et al., 2025). The strengthening process includes resilience building, change management capability, and strategic leadership development to help women entrepreneurs navigate dynamic market environments and economic uncertainties.



**Figure 1. Collaborative HRD Ecosystem Model (CHEM) for Women Entrepreneurs in Indonesian MSMEs**

### **Theoretical Contributions**

This study provides significant theoretical contributions by bridging the gap between HRD and women's entrepreneurship literature in emerging economy contexts. The integration of human capital theory and social capital theory within the HRD framework offers a comprehensive understanding of women entrepreneurship development (Pakpahan, 2025). The model advances existing theoretical frameworks by demonstrating how collaborative ecosystems can address the complex multidimensional challenges faced by women entrepreneurs (Haryati et al., 2022). Unlike previous studies that focus on isolated aspects, this research provides an integrated conceptual framework that recognizes the interconnected nature of competency development, digital empowerment, institutional support, and leadership strengthening.

The theoretical contribution also lies in the recognition that sustainable

women entrepreneurship requires not only individual capability enhancement but also, systemic changes in institutional support mechanisms and collaborative networks (Gunawan, 2025). This perspective aligns with contemporary understanding of entrepreneurship as an ecosystem phenomenon rather than an individual activity.

### **Practical Implications**

The Collaborative HRD Ecosystem Model provides strategic recommendations for multiple stakeholders involved in women entrepreneurship development. For policymakers, the model suggests implementing comprehensive strategies that include education and training in entrepreneurship, enhancing marketing support, leveraging technology and e-commerce, improving financial literacy, increasing access to capital, and creating stronger social networks (Awalia et al., 2025)

**Table 6. Collaborative Human Resource Development Ecosystem Model**

Model Dimension	Main Focus	Implementation Strategy
Entrepreneurial Competency Development	Managerial skills, innovation, financial literacy	Training, workshops, mentoring
Digital Capability Enhancement	Digital literacy and technology adoption	Digital training and e-commerce assistance
Collaborative Institutional Support	Networking and partnership systems	Government, university, and community collaboration
Adaptive Leadership and Resilience	Leadership and psychological resilience	Leadership development and coaching

Educational institutions can utilize the model to design holistic empowerment programs that move beyond basic literacy toward comprehensive digital ecosystem integration (Ayyasy & Maelani, 2024). The model emphasizes the need for continuous training and development programs and creating learning environments that foster innovation and adaptability.

Financial institutions can leverage the model's insights to develop targeted financial products and services that address the specific needs of women entrepreneurs, particularly in digital banking and financial technology adoption (Yuniarti, 2024). The model highlights the importance of financial literacy programs that integrate digital financial management and risk assessment capabilities.

MSME development agencies can implement the model through collaborative mentoring systems, institutional networking programs, and digital transformation support initiatives (Pajri, 2024). The model provides a roadmap for creating integrated support systems that address the multidimensional challenges faced by women entrepreneurs while fostering sustainable business growth and competitiveness.

The practical implementation of this model is expected to contribute to the achievement of broader socio-economic and environmental sustainability goals by strengthening the role of women-led MSMEs in Indonesia's economic development (Judijanto et al., 2024).

## CONCLUSION

This study developed a Collaborative Human Resource Development (HRD) Ecosystem Model for women entrepreneurs in Indonesian MSMEs through an integrative literature review approach. The findings indicate that women entrepreneurs continue to face multidimensional challenges, including limited entrepreneurial competency, low digital capability, restricted access to financial and institutional support, and difficulties in adapting to rapidly changing business environments.

To address these challenges, the study proposes a model consisting of four interconnected dimensions: entrepreneurial competency development, digital capability enhancement, collaborative institutional support, and adaptive leadership and entrepreneurial resilience. The integration of these dimensions emphasizes the importance of a holistic ecosystem approach that combines individual capacity building with supportive institutional and digital environments to promote sustainable women-led MSME development.

The proposed model contributes theoretically by bridging the fields of

human resource development and women's entrepreneurship through an integrated ecosystem perspective. Unlike previous studies that have generally examined competency, digital transformation, institutional support, or leadership as separate factors, this model demonstrates how these dimensions interact to strengthen entrepreneurial performance and sustainability. Practically, the model provides a strategic framework for policymakers, educational institutions, financial institutions, and MSME development agencies to design more comprehensive and collaborative empowerment programs that support women entrepreneurs in the digital era.

Despite its contributions, this study is limited by its reliance on literature-based analysis without empirical validation of the proposed model. In addition, the findings are primarily derived from studies conducted within the context of Indonesian MSMEs, which may limit their generalizability to other socio-cultural and economic environments. Future research should empirically test the model through quantitative, qualitative, or mixed methods approaches, examine its applicability

across different cultural contexts, and explore the integration of emerging technologies such as artificial intelligence, digital platforms, and advanced analytics to enhance the effectiveness and sustainability of women entrepreneurship development initiatives.

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