

Chapter 10

AI-Driven Higher Education and Human Capital Development for Resilient Supply Chains in MENA

Ahmad I. Alsaadi

 <http://orcid.org/0009-0009-9251-6007>

Mohammad V University, Morocco

ABSTRACT

This chapter explores the role of higher education, technological innovation, and governance in fostering sustainable and resilient supply chains in the MENA region. Drawing on secondary qualitative data, it highlights how AI-driven personalized learning, leadership development, and entrepreneurship education contribute to human capital capable of navigating conflict-sensitive environments. The study emphasizes the interplay between educational reform, institutional transparency, and digital transformation as critical factors for adaptive supply chain strategies. Despite limitations in data availability, the chapter provides actionable insights for policymakers, practitioners, and academic institutions aiming to strengthen resilience, sustainability, and innovation in politically and economically fragile contexts.

INTRODUCTION

The Middle East and North Africa (MENA) region faces persistent challenges where political instability, armed conflict, economic sanctions, and rapid tech-

DOI: 10.4018/979-8-3373-6950-1.ch010

nological change converge, creating severe disruptions in supply chains and the broader socio-economic fabric. These intersecting stressors create a complex risk environment characterized by uncertainty, fragmentation, and recurrent shocks that undermine long-term development planning. From ongoing crises in Palestine, Yemen, Syria, Iraq, and Sudan to infrastructural fragility in Libya and Lebanon, supply chains are consistently interrupted, threatening food security, healthcare delivery, humanitarian operations, and commercial continuity. Such disruptions are not episodic but structural, reflecting chronic governance fragility and limited absorptive capacity across critical sectors. While supply chain management (SCM) research has extensively documented these disruptions, the role of education and human capital development in strengthening supply chain sustainability and resilience in high-risk environments remains underexplored (Awashreh et al., 2024). Most existing studies prioritize physical infrastructure, logistics optimization, or emergency response mechanisms, often overlooking the foundational role of skills formation, knowledge systems, and institutional learning. This gap defines the central research problem of this study: understanding how education systems, digital transformation, innovation, and governance interact to enhance sustainable and resilient supply chains in fragile MENA contexts.

Traditional SCM frameworks often assume stable institutions, predictable governance, and readily available skilled labor—assumptions that are rarely held in MENA. These implicit assumptions limit the applicability of mainstream SCM theories in conflict-affected and institutionally weak settings. The erosion of human capital, governance weaknesses, mismatched skills, and underdeveloped innovation ecosystems exacerbate vulnerabilities in logistics, procurement, and infrastructure (Awashreh, 2025 A). In conflict-sensitive contexts, these issues are intensified by disrupted schooling, brain drain, weakened vocational training, and stagnating research and innovation capacities. The cumulative effect is a vicious cycle in which fragile education systems reinforce fragile supply chains, and vice versa. Against this backdrop, higher education institutions—including universities, technical institutes, research centers, and digital learning ecosystems—emerge as central actors in building resilience, serving as incubators for skills, technological literacy, innovation, and leadership (Jurgelevičius et al., 2025).

The significance of this research lies in its potential to inform policy and institutional interventions that strengthen human capital, technological adoption, entrepreneurial capacity, and governance integrity—key factors for mitigating supply chain disruptions and enhancing national resilience. By bridging education policy and SCM scholarship, this study responds directly to calls for more interdisciplinary and context-sensitive resilience research. This study pursues two main objectives: (1) to examine the role of education quality, digitalization, innovation ecosystems, and governance in shaping supply chain resilience in MENA countries, and (2) to

24 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/ai-driven-higher-education-and-human-capital-development-for-resilient-supply-chains-in-mena/406871

Related Content

Content-Based Music Recommendation Using Non-Stationary Bayesian Reinforcement Learning

Brijgopal Bharadwaj, Ramani Selvanambi, Marimuthu Karuppiah and Ramesh Chandra Poonia (2022). *International Journal of Social Ecology and Sustainable Development* (pp. 1-18).

www.irma-international.org/article/content-based-music-recommendation-using-non-stationary-bayesian-reinforcement-learning/292053

The Path Towards Humanistic Management in Extreme Colombia: Higher Purpose, Vanguard Leadership, Authenticity

Carlos Largacha-Martinez (2024). *Organizational Management Sustainability in VUCA Contexts* (pp. 282-300).

www.irma-international.org/chapter/the-path-towards-humanistic-management-in-extreme-colombia/340923

Financial Inclusion and Sustainability: A Contemporary and Future Perspective From Bibliometric Analysis

Fiaz Ahmad, Calvin W. H. Cheong, Rana Tanveer Hussain, Ahmad Salman, Khalil Hussain, Muhammad Khalid Shahid and Muhammad Akram Naseem (2024). *Financial Inclusion, Sustainability, and the Influence of Religion and Technology* (pp. 105-132).

www.irma-international.org/chapter/financial-inclusion-and-sustainability/342238

Sustainability and Entrepreneurship: Fostering Indigenous Entrepreneurship in the Brazilian Amazon Region

Raul Gouvea (2014). *International Journal of Social Ecology and Sustainable Development* (pp. 48-64).

www.irma-international.org/article/sustainability-and-entrepreneurship/120104

The Absorption Characteristics of the European Structural and Investment Funds in the Programming Period 2014 - 2020, in Romania

Florian Marin (2019). *International Journal of Sustainable Economies Management* (pp. 47-57).

www.irma-international.org/article/the-absorption-characteristics-of-the-european-structural-and-investment-funds-in-the-programming-period-2014--2020-in-romania/251203