

Enhancing Agricultural TVET Through Technology and Industry Synergy: Next-Generation Workforce Development in Penang

Shazanah Abdul Wahab

Invest-in-Penang Berhad, Penang, Malaysia

Norzanah Mat Nor

Arshad Ayub Graduate Business School, Universiti Teknologi MARA, Shah Alam, Malaysia

Amirul Abd Rashid

College of Engineering Studies, Universiti Teknologi MARA, Shah Alam, Malaysia

Abstract:

Penang has seen an increasing focus on transforming its agricultural sector to align with modern technological advancements and sustainability goals. This transformation is critical as Penang seeks to reduce its dependence on other states for food and to create a sustainable local food system. Technical and Vocational Education and Training (TVET) offers a unique platform to prepare a skilled workforce capable of supporting agricultural innovation. This study aims to critically assess and advance the integration of agricultural content within TVET programs in Penang. Given agriculture's essential role in regional food security and economic sustainability, there exists a significant misalignment between current TVET curriculum and the sector's evolving needs. Employing a qualitative research approach, including in-depth interviews with TVET educators, industry practitioners, government officials, students, and agricultural entrepreneurs, this study elucidates key challenges and opportunities in embedding contemporary agricultural practices into TVET programs. Findings reveal substantial gaps in curriculum relevance, industry engagement, and technological integration. The study proposes targeted reforms, such as curriculum modernization to include advanced farming techniques, sustainable practices, and technological innovations. Recommendations include fostering robust industry-education partnerships, enhancing public perceptions of agricultural careers through strategic awareness campaigns, implementing targeted financial and non-financial incentives, and investing in advanced technological infrastructure. The study also emphasizes the necessity of supportive policy frameworks and continuous program evaluation to ensure alignment with sectoral demands. This research provides a comprehensive framework for stakeholders to enhance TVET programs, thereby equipping graduates with the requisite skills for the evolving agricultural sector in Penang.

Keywords:

Agriculture, Industry, Technology, TVET, Workforce Development.