ABSTRACT

This policy paper analyzes strategic methods to enhance STEM (Science, Technology, Engineering, and Mathematics) education and workforce alignment in Indonesia, serving as a basis to attain the long-term objectives specified in National Long-Term Development Plan 2025–2045 and the Vision of Golden Indonesia 2045. Notwithstanding numerous reform initiatives, the percentage of STEM graduates has remained unchanged over the previous six years, and their integration into high-value sectors remains constrained. These results indicate underlying structural problems, such as disjointed administration, regional inequalities, insufficient research-industry collaboration, and the lack of a centralized entity to oversee STEM-related policy.

Data collected through desk research and policy document analysis were evaluated using a pseudo-evaluation model and complemented by international benchmarking with Germany, Finland, and Singapore. These countries were chosen for their robust congruence between educational frameworks and labor markets, as well as their established governance structures for STEM advancement. The investigation revealed three significant structural issues: insufficient systemic coherence among STEM programs and institutions, inadequate responsiveness to labor market demands, and disparities in access and quality across regions.

This policy paper presents two strategic options: preserving the current state and establishing either an Integrated National STEM Council or Decentralized STEM Innovation Hubs. The alternatives were reviewed by theoretical forecasting and policy mapping, appraised for feasibility based on four criteria derived from Patton, Sawicki, and Clark (2016): technical feasibility, economic and financial viability, political acceptability, and administrative operability. The Goeller Scorecard assessment determined that the Integrated National STEM Council is the most advantageous option, presenting the highest potential for systemic improvement via centralized coordination, interministerial alignment, and the optimization of current programs.

The proposed strategy aims to minimize redundancy, enhance national monitoring and assessment frameworks, and promote inclusive STEM advancement throughout provinces. The report concludes with recommendations for incremental implementation, quantifiable monitoring indicators, and measurement to mitigate potential implementation hazards.

Keywords: STEM Education, Workforce Development, Public Policy, Higher Education Reform, National Long-Term Development Plan 2045, Innovation, National STEM Strategy