Supervisory Competency of Government Project Engineers Towards Engineering Supervision Performance Model

John Michael L. Tappa
https://orcid.org/0009-0007-4365-8522
jmtappa@yahoo.com
Philippine Christian University, Manila, Philippines

Abstract

This descriptive-quantitative study evaluated the supervisory competencies of 147 Department of Public Works and Highways (DPWH) Region II project engineers across three core domains: technical knowledge and expertise, leadership skills/transformational leadership behaviors, and decision-making and problem-solving abilities. Respondents demonstrated high overall competence in technical knowledge (M = 3.98), transformational leadership (M = 4.21), and decision-making (M = 4.05), though findings underscored the need for continuous technological upskilling and leadership strengthening. Multiple regression analysis indicated that higher supervisory competency significantly predicted shorter project completion timeframes (B = -0.432, $p < 0.001$) and fewer budget overruns (B = -0.281, $p = 0.001$), demonstrating enhanced schedule adherence and cost control. Conversely, competency scores positively predicted infrastructure quality (B = 0.468, $p < 0.001$). Contextually, supervisory competency exerted a strong negative prediction on timelines in large-scale projects (B = -0.501, $p < 0.001$) and a strong positive effect on quality in technologically complex projects (B = 0.493, $p < 0.001$). Based on these empirical results, the study proposed an Engineering Supervision Performance Model (ESPM) anchored on the CIPP Evaluation Framework, Transformational Leadership Theory, and Industry Revolution 5.0 principles. The model promotes human-centered supervision, sustainability, adaptive leadership, and digital integration. To operationalize the ESPM, the study recommends institutionalizing competency assessment tools, specialized technology training, leadership development, performance-based mentoring, and institutional support through policy advocacy.

Keywords: Engineering Management; Supervisory Competency, Transformational Leadership, Engineering Supervision Performance Model; Descriptive-Quantitative Research, Multiple Regression Analysis; Philippines, Asia.