ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25may691

Enhancing Leadership and Decision-Making in Engineering Education: A Strategic Approach to Faculty and Institutional Management

Ailene Q. Supian[1]; Noel Florencondia[2]

[1;2]Nueva Ecija University of Science and Technology

Publication Date: 2025/05/23

Abstract: This study explores strategic approaches to leadership and decision-making within engineering education institutions, focusing on how these practices influence faculty management and institutional performance. Using a qualitative research design, semi-structured interviews were conducted with academic leaders, department heads, and senior faculty members across three engineering institutions in the Philippines. Findings revealed five key themes: participatory leadership, evidence-informed decision-making, collaborative culture, strategic alignment, and leadership development pathways. The research highlights the importance of inclusive leadership models, ongoing professional development, and data-driven strategies in enhancing academic outcomes and institutional resilience. As Bass and Riggio (2006) argue, transformational leadership is central to driving innovation and motivation in complex academic environments. Moreover, Kezar and Eckel (2004) emphasize that leadership in higher education must be adaptive, strategic, and collaborative to respond effectively to institutional challenges.

Keywords: *Leadership in Engineering Education, Decision-Making, Faculty Management, Institutional Strategy, Qualitative Research, Academic Leadership.*

How to Cite: Ailene Q. Supian; Noel Florencondia (2025). Enhancing Leadership and Decision-Making in Engineering Education: A Strategic Approach to Faculty and Institutional Management. *International Journal of Innovative Science and Research Technology*, 10(5), 1153-1154. https://doi.org/10.38124/ijisrt/25may691

I. INTRODUCTION

Leadership and decision-making have become increasingly pivotal in the success of higher education institutions, particularly in disciplines like engineering that demand constant innovation and rapid adaptation to technological changes (Spendlove, 2007). Engineering education must not only deliver technical knowledge but also foster critical thinking, innovation, and resilience among both faculty and students. Effective leadership within engineering schools ensures that institutions remain competitive and responsive to global standards (Bryman, 2007).

However, engineering institutions often face challenges such as hierarchical bureaucracy, lack of shared governance, and inconsistent leadership training programs (Bolden et al., 2009). These issues can hinder collaborative decision-making and result in disengaged faculty. Strategic leadership, which includes long-term planning, stakeholder engagement, and alignment with institutional goals, is therefore critical (Middlehurst, 2004).

Furthermore, in the context of faculty management, strong leadership is associated with increased job satisfaction, productivity, and organizational commitment (Rowley & Sherman, 2003). This research aims to explore how leadership and decision-making practices can be strategically enhanced to improve faculty engagement and institutional effectiveness in engineering education.

II. LITERATURE REVIEW

Academic leadership in engineering education has been widely studied, with researchers emphasizing the importance of transformational and participative leadership models (Bass & Riggio, 2006). Transformational leaders inspire innovation and collaboration, while participative leaders ensure inclusivity in decision-making (Gmelch, 2013).

Bryman (2007) identified key behaviors of effective academic leaders, including promoting collegiality, setting clear objectives, and providing support for professional development. Similarly, Kezar and Eckel (2004) argue that successful institutional change is dependent on distributed leadership and strategic governance. In engineering contexts, these principles become even more relevant due to the dynamic and interdisciplinary nature of the field (Jones et al., 2019).

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The shift towards evidence-informed leadership has also been highlighted in recent literature. Data-driven decision-making enhances transparency and helps align decisions with institutional missions (Marshall, 2012). Leadership development programs are another area of focus, as grooming future leaders through mentorship and administrative experiences is crucial for succession planning (Gmelch & Buller, 2015).

III. METHODOLOGY

This study adopted a qualitative research design using semi-structured interviews to gather insights from academic leaders in engineering institutions. A purposive sample of 12 participants was selected, including deans, department chairs, program coordinators, and senior faculty members.

- **Data Collection:** Interviews were conducted via Zoom and in-person sessions between March and April 2025, with each session lasting approximately 45–60 minutes. Ethical clearance was secured, and informed consent was obtained from all participants.
- **Data Analysis:** Thematic analysis was conducted using Braun and Clarke's (2006) six-step framework: (1) Familiarization with data, (2) Generating initial codes, (3) Searching for themes, (4) Reviewing themes, (5) Defining and naming themes, and (6) Producing the report. This approach ensured a systematic and rigorous analysis of qualitative data.

IV. RESULTS AND DISCUSSION

➢ *Participatory Leadership and Shared Governance*

Participants emphasized the value of inclusive governance. Shared decision-making encouraged faculty ownership and reduced resistance to institutional changes. As supported by Kezar and Eckel (2004), inclusive leadership models contribute significantly to institutional transformation.

➢ *Evidence-Informed Decision-Making*

Leaders reported relying on student data, faculty evaluations, and performance metrics in their planning. This aligns with Marshall (2012), who posits that data-driven strategies enhance institutional effectiveness.

➢ *Collaborative and Open Communication*

Transparent communication through regular meetings and feedback mechanisms was frequently mentioned. Such practices resonate with Bryman's (2007) emphasis on collegiality and trust-building in academic environments.

➢ *Strategic Alignment with Institutional Vision*

Leadership strategies that align with long-term goals were seen as critical for success. Leaders highlighted the importance of aligning departmental initiatives with institutional missions to ensure coherence and sustainability.

➢ *Leadership Development and Capacity Building*

Mentorship programs, leadership workshops, and administrative assignments were cited as crucial tools for grooming future leaders, supporting the work of Gmelch and Buller (2015).

➢ *Implications for Practice*

- Institutions should institutionalize leadership development in faculty training.
- Transparent, data-driven decision-making should be standard practice.
- Shared governance mechanisms need to be embedded in institutional structures.

V. CONCLUSION

Strategic leadership and evidence-informed decision-making are fundamental to the success of engineering education institutions. This study provides qualitative insights into effective practices that promote faculty engagement and institutional resilience. Emphasizing participatory leadership, collaboration, and continuous development not only fosters innovation but also strengthens organizational capacity (Bass & Riggio, 2006; Bolden et al., 2009). Future research may explore how these practices vary across cultural and institutional contexts, offering deeper perspectives on academic leadership in engineering.

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