

Leveraging Artificial Intelligence for Sustainable Faculty Excellence: A Smart Framework for Soft Skills Need Assessment in Management Education

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Abstract:

The increasing integration of Artificial Intelligence (AI) in higher education offers significant potential to enhance faculty capabilities and promote institutional sustainability. However, soft skills development among management faculty often depends on traditional and subjective training need assessment methods, limiting long-term effectiveness. Drawing on Human Capital Theory, Competency-Based Management, and Sustainable HRM principles, this study proposes a conceptual framework that utilizes AI to establish a systematic and data-driven approach for assessing soft skills needs. The framework incorporates competency mapping, AI-driven analytics, and performance metrics to identify skill gaps, prioritize training interventions, and align faculty development with sustainability goals. By embedding predictive and diagnostic intelligence into faculty development systems, the model improves decision-making accuracy, minimizes bias, and supports continuous professional growth. It emphasizes sustainable faculty excellence by integrating technological innovation with responsible talent management practices, thereby strengthening institutional competitiveness and long-term academic resilience in a rapidly evolving digital education environment.

Keywords: *Artificial Intelligence; Sustainable Faculty Excellence; Soft Skills Development; Need Assessment Framework; Smart HRM; Competency Mapping; Management Education; Sustainable Human Capital Development*

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1. Introduction

Artificial Intelligence (AI) is rapidly transforming higher education by enabling data-driven decision-making, predictive analytics, and intelligent academic management systems (Zawacki-Richter et al., 2019). Universities are increasingly adopting AI-enabled tools to enhance teaching quality, research productivity, and faculty development processes, making capability development a strategic priority as institutional effectiveness depends on the competencies and adaptability of academic staff. In management education, faculty effectiveness extends beyond subject expertise to include essential soft skills such as communication, emotional intelligence, mentoring, collaboration, and leadership, which significantly influence classroom engagement and student employability outcomes. However, assessment of faculty soft skills continues to rely on traditional Training Need Assessment (TNA) methods such as periodic appraisals and subjective feedback, which is episodic and weakly, aligned with competency frameworks. AI-enabled analytics offers a transformative alternative by supporting

continuous competency monitoring, objective skill gap identification, and personalized training interventions (Salas et al., 2012). Despite growing research on AI in education, limited attention has been given to AI-based soft skills assessment frameworks aligned with Sustainable Human Resource Management. Addressing this gap, the present study proposes a conceptual AI-enabled, competency-driven framework to achieve sustainable faculty excellence and institutional effectiveness (Choudhary et al, 2024).

2. Background of Study

The increasing digitization of higher education has created a pressing need for innovative, data-driven approaches to faculty development, particularly in management education where soft skills such as communication, leadership, and emotional intelligence play a pivotal role in shaping student outcomes and institutional effectiveness. Traditional Training Need Assessment (TNA) practices, largely based on periodic appraisals and subjective evaluations, are often insufficient to capture evolving competency requirements in a dynamic academic environment. In this context, the integration of Artificial Intelligence (AI) offers significant potential to transform faculty development systems by enabling continuous performance monitoring, predictive analytics, and personalized learning interventions (Gaikwad, 2024). A competency-driven, AI-enabled framework can systematically identify skill gaps, align faculty capabilities with institutional sustainability goals, and support long-term professional excellence. This approach is consistent with the principles of sustainable human resource management, which emphasize continuous learning, adaptability, and strategic talent development to enhance organizational resilience and competitiveness in the knowledge economy (Bondarouk & Brewster, 2016).

3. Scope and significance of study

The scope of this study focuses on developing and conceptualizing an Artificial Intelligence (AI)-enabled framework for assessing soft skills training needs among management faculty, with particular emphasis on integrating competency mapping, continuous performance analytics, and data-driven decision-making systems. It encompasses the evaluation of key soft skill domains such as communication, leadership, collaboration, and emotional intelligence, aligning them with institutional objectives and long-term sustainability goals in higher education. The study is limited to management education contexts but provides a scalable model that can be adapted across academic institutions seeking to enhance faculty effectiveness through technology-enabled interventions. The significance of the study lies in its contribution to bridging the gap between traditional Training Need Assessment (TNA) practices and modern, intelligent systems by introducing a structured, objective, and continuous mechanism for faculty development. By aligning AI-driven analytics with Sustainable Human Resource Management principles, the proposed framework supports improved decision-making, reduces subjectivity, enhances training effectiveness, and promotes sustainable faculty excellence, thereby strengthening institutional competitiveness and long-term academic resilience in a digital learning ecosystem (Marler & Boudreau, 2017).

4. Objectives of the Study

- To examine the role of Artificial Intelligence (AI) in enhancing soft skills need assessment among management faculty
- To identify key soft skill competencies required for effective teaching and academic performance in management education
- To analyze the limitations of traditional Training Need Assessment (TNA) methods in evaluating faculty soft skills
- To develop a competency-based, AI-enabled framework for continuous and objective assessment of faculty development needs

- To evaluate how AI-driven training interventions can contribute to sustainable faculty excellence and institutional effectiveness

5. Literature Review

Artificial Intelligence (AI) is significantly transforming higher education by enabling intelligent automation, predictive analytics, and data-driven academic decision-making processes. Advanced AI technologies such as learning analytics, natural language processing, and intelligent tutoring systems are increasingly used to monitor teaching effectiveness, student engagement, and learning outcomes, thereby strengthening faculty capability development (Zawacki-Richter et al., 2019). Institutions are adopting AI-driven platforms to enhance faculty performance evaluation and professional development planning through integrated academic data systems. These systems combine inputs such as teaching feedback, research productivity, and collaboration patterns to enable competency tracking, performance prediction, and personalized development interventions, reducing subjectivity and improving decision accuracy (Holmes et al., 2022). In this context, the importance of soft skills in management education has gained prominence, as faculty effectiveness extends beyond subject expertise to include communication, emotional intelligence, mentoring, collaboration, and leadership competencies. These skills play a crucial role in shaping classroom engagement, experiential learning, and student employability outcomes, while also influencing institutional reputation and academic quality (Goleman, 2017).

Training Need Assessment (TNA) remains a fundamental component of faculty development systems; however, traditional approaches such as performance appraisals, self-assessments, and feedback mechanisms are largely episodic, perception-based, and limited in their ability to identify dynamic competency gaps. These methods often suffer from bias, lack of real-time insights, and absence of predictive capabilities, resulting in generic training interventions that may not effectively address actual skill deficiencies (Salas et al., 2012). In higher education, sustainable faculty excellence involves continuous learning, adaptability, and sustained academic performance over time (Ehnert et al., 2016). Integrating AI-enabled analytics with sustainable HRM principles can facilitate continuous competency monitoring, early identification of skill gaps, and personalized development pathways, thereby enhancing faculty effectiveness and supporting long-term institutional resilience and competitiveness.

6. Research Gap and Problem Statement

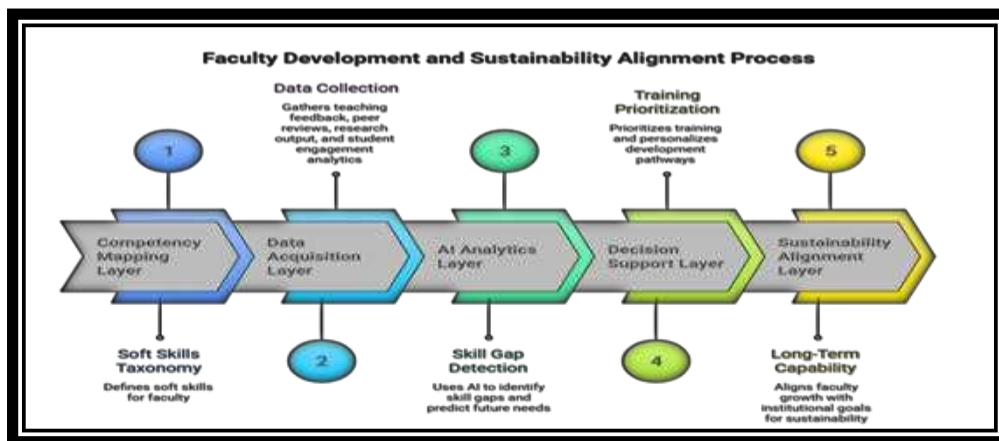
Despite growing interest in Artificial Intelligence applications in higher education, significant gaps remain in faculty competency development research. Existing AI studies predominantly focus on student learning analytics and administrative automation, with limited attention to systematic assessment of faculty soft skills. There is an absence of AI-based frameworks designed specifically for continuous and objective soft skills need assessment in academia, particularly within management education. The faculty development systems in higher education largely rely on episodic and subjective evaluation approaches, resulting in limited competency intelligence and inadequate identification of dynamic skill gaps. These gaps highlight the need for a conceptual AI-enabled framework that integrates competency mapping, continuous analytics, and sustainability alignment to support systematic soft skills assessment and sustainable faculty excellence in management education.

7. Discussion and Analysis

The proposed AI-enabled framework for soft skills need assessment in management education comprises five integrated layers that collectively create a smart and sustainable faculty development system. The competency mapping layer establishes a structured taxonomy of essential soft skills such as communication, emotional intelligence, mentoring, collaboration, adaptability, leadership, professional ethics, and industry engagement, supported by clearly defined behavioral indicators to

enable measurable assessment. The data acquisition layer gathers multidimensional performance data from sources including teaching feedback, peer reviews, research outputs, and student engagement analytics, ensuring a holistic and continuous evaluation of faculty competencies. The AI analytics layer processes this data using intelligent algorithms and machine learning techniques to identify skill gaps, recognize behavioral patterns, and predict future development needs by benchmarking observed performance against defined competencies. The decision support layer translates these insights into actionable strategies by recommending personalized training, mentoring, and coaching interventions, thereby enhancing the effectiveness of faculty development initiatives. However, the excessive use and overdependence may lead to the digital stress at times (Gaikwad & Bhattacharya, 2024).

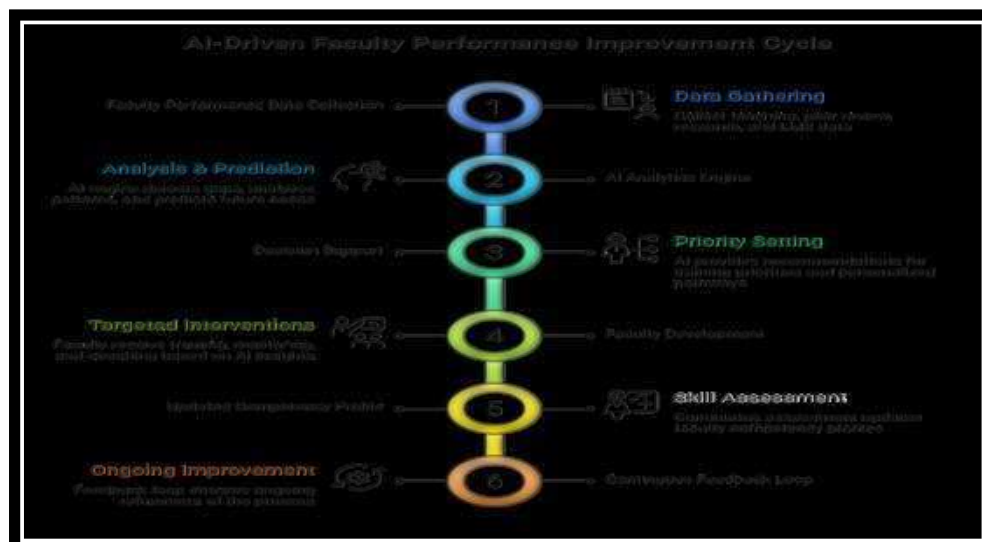
Figure 1. AI-Enabled Sustainable Soft Skills Need Assessment Framework for Management Faculty



8. Proposed AI-Enabled Soft Skills Need Assessment Model

The proposed AI-enabled soft skills need assessment model converts the conceptual framework into a continuous, data-driven faculty development system. The model integrates competency benchmarks, faculty performance data, AI analytics, and decision support to identify and address soft skills gaps systematically. Faculty activities generate multidimensional data from teaching feedback, peer review, research output, and engagement analytics. AI algorithms analyze these data against competency standards to detect skill gaps, recognize behavioral patterns, and predict development needs.

Figure 2. AI-Enabled Soft Skills Need Assessment Model Flow



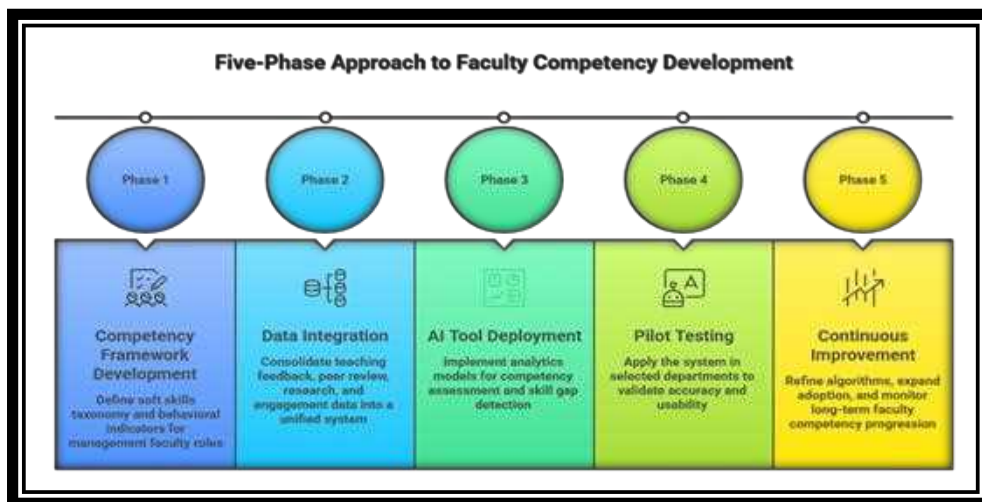
9. Implementation Strategy in Management Institutions

Successful adoption of the proposed AI-enabled soft skills need assessment model requires institutional readiness and a phased implementation approach to ensure technical feasibility and faculty acceptance.

- **Institutional Readiness Requirements:** Effective implementation depends on three key readiness dimensions. Digital infrastructure is essential to capture and process faculty performance data through learning management systems, feedback platforms, and analytics tools. Institutions must ensure data storage, integration capability, and basic AI-enabled analytics support. A supportive data culture is equally important. Institutions should promote evidence-based decision-making, standardized competency frameworks, and systematic data collection practices across teaching, research, and academic engagement activities. The faculty acceptance is critical for sustainability. Transparent communication about developmental intent, data privacy safeguards, and benefits of personalized professional growth can reduce resistance and build trust in AI-assisted evaluation systems.

- **Implementation Phases**

Fig-3: Five Phase Approach to Faculty Competency Development



10. Expected Outcomes and Contributions

The proposed AI-enabled soft skills need assessment framework is expected to enhance faculty development effectiveness and contribute to sustainable academic excellence in management institutions.

At the faculty level, the model enables objective identification of soft skills strengths and gaps through continuous analytics, supporting personalized development pathways and targeted training interventions. Faculty members benefit from data-driven feedback, improved self-awareness, and ongoing competency enhancement aligned with professional roles.

At the institutional level, the framework supports evidence-based faculty development planning, improved teaching quality, and stronger alignment between faculty capabilities and strategic goals. Continuous competency tracking enables institutions to monitor academic capability growth, foster innovation, and strengthen stakeholder engagement, thereby enhancing institutional competitiveness and sustainability.

At the academic and research level, the study contributes a novel integration of Artificial Intelligence, competency-based management, and Sustainable Human Resource Management within higher education contexts. It extends faculty development literature by introducing a systematic AI-

enabled soft skills assessment model for management education. The framework also provides a scalable foundation for future empirical validation and AI-driven faculty analytics research.

11. Conclusion

This study proposed AI-enabled soft skills need assessment framework designed to support systematic and sustainable faculty development in management education. The framework integrates competency mapping, continuous performance data acquisition, AI-driven analytics, and decision support within a sustainability-aligned architecture. By transforming traditional episodic training need assessment into a continuous, data-driven process, the model enables objective identification of faculty soft skills gaps and personalized development pathways. The framework plays a significant role in promoting sustainable faculty excellence by fostering ongoing competency enhancement, reducing evaluation bias, and aligning faculty growth with institutional goals such as teaching quality, innovation, and stakeholder engagement. Continuous competency tracking further supports long-term academic capability building and institutional resilience in an evolving digital education environment. The study contributes to the emerging smart management education ecosystem by bridging Artificial Intelligence, competency-based faculty development, and sustainable human resource management and higher education.

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