

Automated Teacher Behavior Inventory Management System with AI-Driven Recommendations

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Introduction: Teacher evaluation is a fundamental component in improving educational outcomes, yet traditional methods often face challenges related to data accuracy, timeliness, and actionable feedback. Recognizing this, the researcher sought to enhance its evaluation process by leveraging technology to support academic quality. This study focused on the development of a system software titled *Automated Teacher Behavior Inventory Management System with AI-Driven Recommendations*. It aimed to address institutional challenges in evaluating teacher performance by automating survey collection, analysis, and providing data-driven recommendations for professional development.

Methodology: This developmental research employed a system development approach to design and implement a teacher evaluation system. Data was collected through a standardized student survey measuring six key areas: Subject Matter Competence, Teaching Styles, Personality Traits, Classroom Management, Learning Assessment, and Overall Impression. Python's Pandas library was used for data analytics, while AI-generated recommendations were produced through the OpenAI API and pre-trained datasets for offline use. The system included built-in mechanisms to prevent duplication and ensure the quality of generated feedback.

Results: Results showed that the system effectively identified areas for teacher improvement by analyzing survey scores. The AI-driven recommendations, whether generated online via API or offline using preloaded datasets, were found to align closely with the developmental needs identified by the guidance and HR departments. The system's duplication prevention mechanism ensured that recommendations were unique and meaningful. Moreover, the offline functionality allowed seamless access to recommendations even during connectivity disruptions.

Conclusion: The *Automated Teacher Behavior Inventory Management System with AI-Driven Recommendations* successfully addressed the institutional need for a more efficient and insightful evaluation process. By integrating data analytics and AI-generated feedback, the system provided meaningful and personalized professional development suggestions, fostering a culture of continuous improvement in teaching performance.

Practical Value: The practical value of this study lies in its demonstration of how artificial intelligence and automation can be utilized to enhance teacher evaluations. The integration of AI ensures that feedback is tailored, relevant, and timely, contributing to the professional growth of faculty members. With its offline capabilities and data analytics, the system stands as a model for other academic institutions aiming to modernize their performance evaluation methods.

Direction for Future Research: To further improve the Automated Teacher Behavior Inventory Management System, recommendations include expanding evaluation categories to cover teaching methodology, student engagement, and feedback mechanisms. Enhancing scalability is essential to accommodate institutional growth, while integrating advanced analytics can provide deeper insights for personalized professional development. Additionally, linking the platform with the Learning Management System (LMS) will streamline data sharing. Finally, regularly updating the AI algorithms based on emerging research and user feedback is crucial for maintaining the system's responsiveness and long-term efficacy.

Keywords: information technology, teacher behavior inventory, AI-driven recommendations, developmental research, Philippines

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