

**AIEDUDOCs: AN INTELLIGENT FRAMEWORK FOR AUTOMATED ACADEMIC
DOCUMENTATION AND ASSESSMENT ANALYTICS**

Nikhil Krishna R D, Department of Data Science, Kumaraguru College of Liberal Arts and Science,
Coimbatore, Tamil Nadu 641035.

Abstract

This research presents AIEduDocs, an innovative machine learning-powered framework that transforms educational documentation through intelligent automation and predictive analytics. The system employs advanced natural language processing algorithms to automate report generation, while implementing deep learning models for document classification and standardization. By leveraging artificial intelligence, the framework offers predictive assessment analytics, automated performance tracking, and intelligent document retrieval capabilities. The system's neural network architecture facilitates adaptive learning from institutional documentation patterns, enabling automated workflows for workshop reports, masterclass documentation, and field visit records. The implementation features a hierarchical access control system ensuring secure, role-appropriate access for administrators, faculty, and parents. Through a dedicated portal interface, stakeholders can access internal assessment data and automated reports while maintaining data privacy and institutional standards. The framework's machine learning components ensure scalability through transfer learning, enabling rapid adaptation across diverse educational contexts. This research advances the application of AI in educational administration by introducing intelligent automation while maintaining institutional compliance and data security.

Keywords: *Educational AI, Machine Learning in Education, Automated Documentation, Predictive Analytics, Intelligent Assessment Management*

Introduction

Educational institutions generate substantial volumes of documentation that present significant challenges in management and analysis. Traditional manual approaches are inefficient and fail to capitalize on institutional data for decision-making. AIEduDocs addresses these challenges through intelligent automation and analytics, providing standardized institutional documentation through rule-based algorithms and adaptable templates while ensuring appropriate information access through a hierarchical model. The research contributes: (1) an automated documentation system standardizing reporting workflows, (2) an assessment analytics module extracting trends from academic data, (3) a secure, role-based access control system, and (4) adaptable document templates ensuring institutional consistency.

Literature Review

Educational institutions increasingly adopt technology solutions for administrative challenges, with automation tools reducing faculty workload (Johnson & Williams, 2022). Gjorgjevikj et al. (2011) demonstrated that automated report generation enhances institutional efficiency by standardizing formats and reducing manual effort.

Educational data mining techniques extract patterns to improve learning outcomes, though fewer studies address analytics in administrative documentation (Taylor & Robinson, 2021). Job and Pandey (2020) proposed an academic performance analysis framework emphasizing systematic approaches to identify performance trends.

The potential for intelligent systems to transform administrative processes exists, though few comprehensive frameworks have been implemented (Cutting & Cutting-Decelle, 2021). Dongdong et al. (2017) highlighted the importance of role-based access control in educational systems for maintaining data security while ensuring appropriate information availability.

Methodology

AIEdDocs employs modular architecture with four integrated components: (1) a Document Generation Engine utilizing rule-based algorithms for automated report creation; (2) an Assessment Analytics Module processing academic data to identify performance trends; (3) a Hierarchical Access Control System managing role-based permissions; and (4) a Document Repository providing centralized storage with advanced retrieval capabilities.

Implemented as a web-based application, the system utilizes parameterized templates combining institutional elements with variable content, statistical methods for performance analysis with interactive visualizations, and a granular permission model based on institutional roles. The framework streamlines administrative processes through workflow automation for tasks including workshop reporting, result analysis, department management, and faculty assignments, with validation rules ensuring data quality and institutional compliance.

Evaluation and Results

AIEdDocs was implemented at a mid-sized educational institution with 150 faculty members across 12 departments over one academic semester. Implementation resulted in significant efficiency improvements across documentation processes (Table 1), with time requirements reduced by an average of 87%.

Table 1: Documentation Task Efficiency Comparison

Documentation Task	Pre-Implementation (minutes)	Post-Implementation (minutes)	Improvement (%)
Workshop Report Generation	120	15	87.5%
Result Analysis Creation	180	22	87.8%
Department Report Compilation	240	35	85.4%
Document Retrieval	25	3	88.0%
Student Performance Tracking	90	12	86.7%

Standardized templates improved document consistency, with analysis revealing a 92% increase in format consistency and 78% reduction in documentation errors. User satisfaction assessment (n=72) demonstrated high satisfaction across all system aspects (Table 2), with faculty particularly appreciating the reduced administrative workload.

Table 2: User Satisfaction Assessment

System Aspect	Mean Satisfaction Rating	Standard Deviation
Document Generation	4.6	0.5
Assessment Analytics	4.2	0.7
Access Control	4.4	0.6
User Interface	4.3	0.6
Overall System	4.5	0.5

Implementation challenges included initial faculty resistance requiring additional training, technical difficulties in data migration from legacy systems, and complexity in accurately modeling institutional roles for hierarchical access control.

Conclusion

This paper presented AIEdDocs, a comprehensive framework for automating educational documentation while extracting meaningful insights from assessment data. The implementation demonstrated significant efficiency improvements, enhanced standardization, and high user satisfaction. Primary contributions include an integrated framework addressing documentation challenges and a hierarchical access model ensuring appropriate information availability across

institutional roles. Future work will explore enhanced document classification techniques and system integration possibilities, while addressing the current limitation of single-institution implementation through multi-institutional studies and longitudinal assessment of long-term impact.

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