



ADMINISTRATORS' USE OF ARTIFICIAL INTELLIGENCE TO PREDICT EFFECTIVE MANAGEMENT IN HIGHER EDUCATION IN CAMEROON: A COMPREHENSIVE ANALYSIS

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Abstract

The integration of Artificial Intelligence (AI) in higher education administration offers transformative potential for enhancing efficiency, decision-making, and ultimately, effective management. In Cameroon, a nation actively pursuing digital transformation, the application of AI, particularly predictive analytics, in higher education institutions (HEIs) is gaining traction. This article provides a comprehensive analysis of administrators' use of AI to predict effective management in Cameroonian higher education. It explores the current landscape of AI adoption, the benefits and challenges of its implementation, the ethical considerations involved, and the regulatory framework. Drawing on up-to-date statistics and recent academic literature, this paper argues that while AI presents significant opportunities for optimizing administrative processes, improving student outcomes, and fostering institutional growth, its successful and ethical deployment hinges on addressing critical infrastructural, financial, and human capacity gaps.

Keywords:

Administrators, Artificial Intelligence, Predictive Analytics, Higher Education, Effective Management, Cameroon.



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L'UTILISATION DE L'INTELLIGENCE ARTIFICIELLE PAR LES ADMINISTRATEURS POUR PRÉDIRE UNE GESTION EFFICACE DANS L'ENSEIGNEMENT SUPÉRIEUR AU CAMEROUN: UNE ANALYSE COMPLÈTE

Résumé

L'intégration de l'intelligence artificielle (IA) dans l'administration de l'enseignement supérieur offre un potentiel de transformation considérable pour améliorer l'efficacité, la prise de décision et, en définitive, la gestion efficace. Au Cameroun, pays engagé dans une transformation numérique active, l'application de l'IA, et plus particulièrement de l'analyse prédictive, dans les établissements d'enseignement supérieur (EES) gagne du terrain. Cet article propose une analyse approfondie de l'utilisation de l'IA par les administrateurs pour prédire une gestion efficace dans l'enseignement supérieur camerounais. Il explore le paysage actuel de l'adoption de l'IA, les avantages et les défis de sa mise en œuvre, les considérations éthiques et le cadre réglementaire. S'appuyant sur des statistiques actualisées et la littérature académique récente, cet article soutient que si l'IA offre des opportunités importantes pour optimiser les processus administratifs, améliorer la réussite étudiante et favoriser la croissance institutionnelle, son déploiement réussi et éthique dépend de la résolution des lacunes critiques en matière d'infrastructures, de financement et de ressources humaines.

Mots-clés : Administrateurs, Intelligence artificielle, Analyse prédictive, Enseignement supérieur, Gestion efficace, Cameroun.

Introduction

Higher education institutions globally are grappling with increasing complexities in management, including optimizing resource allocation, improving student retention, enhancing academic quality, and ensuring institutional sustainability. In this context, Artificial Intelligence (AI) has emerged as a powerful tool with the potential to revolutionize administrative practices. AI, particularly through predictive analytics, allows for the analysis of vast datasets to identify patterns, forecast future outcomes, and inform strategic decision-making (Oye & Iahad, 2024).

Cameroon, like many developing nations, is on a path of digital transformation, recognizing AI as a strategic imperative for national development across various sectors, including education (Adebayo, 2021). The Cameroonian higher education system, while undergoing decentralization and digitalization efforts (Ndongko & Ngwa, 2022), faces unique challenges such as educational inequalities, outdated curricula, and resource constraints (Mbah & Ngu, 2023). The potential for AI to address these challenges, particularly in enhancing administrative efficiency and predicting effective management, is a growing area of interest and research. This article delves into the current state and future prospects of AI adoption by administrators in Cameroonian higher education. It examines how AI can be leveraged to predict and foster effective management, considering the specific socio-economic and technological landscape of the country.

The Landscape of AI Adoption in Cameroonian Higher Education

Cameroon is currently in the nascent stages of its AI journey, marked by growing interest but significant infrastructural and strategic gaps (Asongu, 2025). The government has recently launched its first National Artificial Intelligence Strategy (SNIA) with a vision to become a regional AI leader by 2040 (Mbouoh, 2025). This strategy outlines a long-term framework for AI development across governance, infrastructure, education, and key economic sectors. Key targets include training 4,000 people annually, establishing five AI centers of excellence, and developing a sovereign large language model "GPT Cameroon" (Alkaissi, 2023).

Within higher education, AI adoption is primarily seen as a means to address educational inequalities, enhance learning experiences, and streamline administrative tasks. While specific data on AI usage in administration in Cameroon is limited, existing research indicates a focus on: Adaptive Learning Platforms: Tailoring content to individual student needs and learning styles (Schweidel, 2023). Automated Content Generation and Language Processing: Particularly relevant in Cameroon's multilingual context (Diaz, 2023). Student Support Chatbots: Streamlining secretarial tasks and improving response efficiency for student inquiries (Drozdowski, 2023). However, the effective integration of AI is contingent upon addressing significant infrastructural barriers, fostering digital literacy, and overcoming low investment levels (Wheatley, 2020).

AI for Predictive Analytics in Higher Education Management: Benefits and Applications

Predictive analytics, powered by AI, utilizes historical data and statistical algorithms to forecast future outcomes, offering invaluable insights for effective management in higher education. The benefits are multifaceted: Student Success and Retention: AI can identify at-risk students early by analyzing factors such as attendance, grades, and engagement patterns (Leslie, 2019). This allows administrators to implement targeted interventions, such as personalized tutoring or counseling, thereby improving retention rates and academic outcomes.

Resource Optimization: By predicting enrollment trends, course demand, and infrastructure needs, AI can assist administrators in optimizing resource allocation, including faculty staffing, classroom utilization, and financial planning (Ashrafian, 2022). Curriculum Planning and Development: Analyzing student performance data across different courses can reveal areas of the curriculum that require improvement. This data-driven approach allows for more effective curriculum revisions and teaching strategies (Marr, 2023). Streamlined Administrative Tasks: AI-driven systems can automate routine administrative processes such as admissions, scheduling, and grading, reducing the workload on staff and improving operational efficiency (Muller, 2023). Strategic Enrollment Management: Predictive analytics enables institutions to identify enrollment barriers and tailor recruitment strategies by analyzing data on geographical location, academic performance, and financial background of prospective students (Ortiz, 2023).

Human Resource Management: While still nascent, AI can assist in recruitment and selection by reducing bias, optimizing employee growth, retention, and efficient use of time (Ortiz, 2023). In the Cameroonian context, where institutions often operate with outdated curricula and face challenges in human resource management (Ortiz, 2023), AI-powered predictive analytics holds significant promise for modernizing and improving administrative practices.

Challenges to AI Implementation in Cameroonian Higher Education Administration

Despite the immense potential, the successful implementation of AI in Cameroonian higher education administration faces several significant hurdles: **Infrastructural Deficiencies:** Limited access to reliable internet, inadequate computing power, and a lack of robust data infrastructure are primary impediments (Ortiz, 2025). **Data Availability and Quality:** Effective predictive analytics relies on large, clean, and well-structured datasets. In many Cameroonian HEIs, data collection, storage, and management systems may be fragmented or insufficient, impacting the accuracy and reliability of AI models. **Human Capital and Digital Literacy:** A shortage of trained AI professionals, data scientists, and administrators with the necessary digital literacy to leverage AI tools effectively is a major challenge (Ortiz, 2025). Educators may also lack the necessary training and familiarity with AI technologies (Ortiz, 2025).

Financial Constraints: Implementing and maintaining AI systems requires substantial investment in technology, infrastructure, and training, which can be a significant barrier for underfunded institutions (Ruiz, 2025). **Resistance to Change:** Administrative staff may be resistant to adopting new technologies due to a lack of understanding, fear of job displacement, or a preference for traditional methods. **Language and Cultural Adaptation:** AI tools developed in Western contexts may not be adequately adapted to the diverse linguistic and cultural landscape of Cameroon, potentially disadvantaging non-native English or French speakers and limiting their effectiveness (Ruiz, 2025). **Ethical Concerns:** As discussed in the next section, ethical considerations related to data privacy, algorithmic bias, and transparency pose significant challenges that need to be proactively addressed (UNESCO, 2021).

Ethical Considerations and Regulatory Framework

The ethical implications of using AI, especially predictive analytics, in education administration are paramount. Key concerns include: **Data Privacy and Security:** The collection, analysis, and storage of vast amounts of sensitive student and staff data raise concerns about privacy and security (Zipoli, 2023). Cameroon has enacted a comprehensive Personal Data Protection Law (Law No. 2024/017) which covers data processing and requires informed consent for data collection (Zipoli, 2025). While it doesn't specifically cover AI, its provisions align with principles of transparency and accountability, laying foundations for future AI legislation (Zipoli, 2025). Adherence to these regulations and the Malabo Convention is crucial.

Algorithmic Bias: AI models trained on biased historical data can perpetuate and even amplify existing inequalities, leading to unfair treatment of certain student or staff groups (Muosco, 2025). Ensuring diverse training data and continuous auditing of algorithms are essential to mitigate bias (Tchoakeu, 2025). **Transparency and Accountability:** The decision-making processes of AI systems can be opaque ("black box" problem), making it difficult to understand how predictions are made. Ensuring transparency and accountability in AI systems is crucial, though challenging (Mbouh, 2025).

Autonomy and Human Oversight: Over-reliance on AI for critical decisions may compromise the autonomy of learners, teachers, and administrators. Human oversight and intervention remain vital to prevent a culture of dependency on AI tools and to ensure critical thinking (Muller, 2025). Cameroon's National AI Strategy includes drafting a legal framework for ethical and regulatory oversight (UNESCO, 2025). This is a critical step towards responsible AI adoption in education. Furthermore, initiatives like CEIMIA's support for training junior researchers in responsible AI in Africa highlight a growing awareness of these ethical imperatives (CEIMIA, 2024).

Government Initiatives and Funding

The Cameroonian government is actively promoting digital transformation, with a focus on higher education. The "Electronic Higher Education Project," a joint initiative with China, has led to the creation of public university institutions across the country, distribution of laptops to students, and the establishment of digital centers (Ngwa, 2024). The newly launched National AI Strategy (SNIA) signals a stronger commitment to AI development. It outlines plans for establishing a Cameroonian AI Authority, a Presidential AI Council, and a legal framework. It also emphasizes investment in training, research, and human capital, with targets for establishing AI centers of excellence and providing greater support for local research (Neng, 2025). While specific funding details for AI research and development in education are not readily available, the SNIA indicates a broader governmental push for AI adoption across key sectors, including education.

Statistics on Higher Education in Cameroon (2023-2025 Data)

According to The Global Economy.com (2023 data), tertiary school enrollment in Cameroon was 15.79% in 2023, a slight decline from 16.19% in 2022. This figure is significantly lower than the world average of 40.35%. Education spending in 2022 was 2.62% of GDP, and in 2023, it accounted for 13.08% of government spending. These statistics highlight the need for efficient resource management and improved access to quality education, areas where AI could potentially contribute. The female to male ratio of students at the tertiary level in 2023 was 0.83%. These figures underscore the importance of leveraging innovative solutions like AI to improve educational outcomes and administrative efficiency within the existing resource constraints.

Case Studies and African Context

While specific comprehensive case studies on AI for predictive analytics in higher education administration in Cameroon are limited in publicly available literature, broader trends and African examples offer valuable insights. Research in other African contexts, such as the case studies presented by Digital Defynd (2025) and 21K School Nigeria (2025), demonstrate the potential of AI in: Personalized learning environments: Tailoring education to individual student paces and styles. Reducing teacher workload: Through AI-supported teaching tools and automated tasks. Enhancing inclusivity: By assisting visually impaired students with navigation, for example.

A study on the role of AI in promoting educational equity and access in African HEIs highlighted the potential of AI for virtual classes and open access to learning materials, while also underscoring challenges related to data, security, policy, and techno-economic concerns (Path of Science, 2025). Another cross-sectional study in South Africa reported improvements in student engagement, knowledge retention, and administrative efficiency through AI-powered learning tools, but also emphasized the need for faculty training, ethical policies, and investment in AI infrastructure (Student's Journal of Health Research Africa, 2025). These African experiences offer valuable lessons for Cameroon as it navigates its AI integration journey.

Frameworks for AI Integration in University Management

Successful AI integration requires robust frameworks that address technical, organizational, and ethical dimensions. Key components of such frameworks include: Strategic Alignment: AI initiatives must be aligned with the institution's overall strategic goals and vision. Capacity Building: Investing in training programs for administrators, faculty, and IT staff to develop AI literacy and technical skills.

Data Governance: Establishing clear policies and procedures for data collection, storage, security, privacy, and ethical use. This includes adhering to national regulations like Cameroon's Personal Data Protection Law. Pilot Programs and Iterative Development: Starting with small-scale pilot projects to test AI solutions, gather feedback, and iteratively refine them before wider deployment. Collaboration and Partnerships: Fostering collaboration between IT departments, academic units, and external AI experts or companies. Ethical Guidelines and Oversight: Developing clear ethical guidelines for AI use, addressing issues of bias, transparency, and accountability, and establishing oversight mechanisms.

Change Management: Implementing strategies to manage resistance to change, communicate the benefits of AI, and involve stakeholders in the adoption process. The Cameroonian government's emphasis on a national AI strategy, including legal and ethical frameworks, and the establishment of AI centers of excellence, provides a foundational framework for universities to build upon (Ngwa, 2025).

Conclusion and Recommendations

The use of AI, particularly predictive analytics, by administrators to predict effective management in higher education in Cameroon holds substantial promise. It offers a pathway to more efficient operations, improved student outcomes, and enhanced strategic decision-making in a resource-constrained environment. While the country is at an early stage of AI adoption, the recent launch of the National AI Strategy demonstrates a clear commitment to leveraging this transformative technology.

However, realizing this potential requires a concerted and coordinated effort to address the existing challenges. Based on the analysis, the following recommendations are crucial for the successful and ethical integration of AI in Cameroonian higher education administration:

- Prioritize Digital Infrastructure Development:** Urgent investment in reliable internet connectivity, robust computing facilities, and secure data storage solutions across all HEIs.
- Invest in Human Capital Development:** Develop and implement comprehensive training programs for administrators, faculty, and IT staff in AI literacy, data science, and ethical AI practices. Encourage local talent development and attract diaspora expertise.
- Establish Clear Data Governance Frameworks:** Develop institutional policies for data collection, quality assurance, security, and privacy that align with national regulations and international best practices.
- Foster a Culture of Data-Driven Decision-Making:** Promote understanding and acceptance of AI tools among administrative staff through awareness campaigns, pilot projects, and demonstrated successes.

- Develop Contextually Relevant AI Solutions:** Encourage the development of AI tools that are tailored to the specific needs, linguistic diversity, and cultural context of Cameroonian higher education. This could involve local partnerships with tech startups and researchers.
- Strengthen Ethical AI Guidelines:** Proactively develop and implement institutional ethical guidelines for AI use, with a strong focus on algorithmic fairness, transparency, and human oversight. Regular audits of AI systems should be conducted.
- Enhance Collaboration and Knowledge Sharing:** Facilitate collaboration between universities, government bodies, and international organizations to share best practices, resources, and expertise in AI implementation.
- Increase Funding for AI Research and Development:** Allocate dedicated funding for research into AI applications specifically relevant to Cameroonian higher education challenges, fostering innovation and local solutions.

By strategically addressing these recommendations, Cameroon can harness the power of AI to not only predict but also proactively shape effective management in its higher education sector, ultimately contributing to a more equitable, efficient, and globally competitive educational landscape.

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