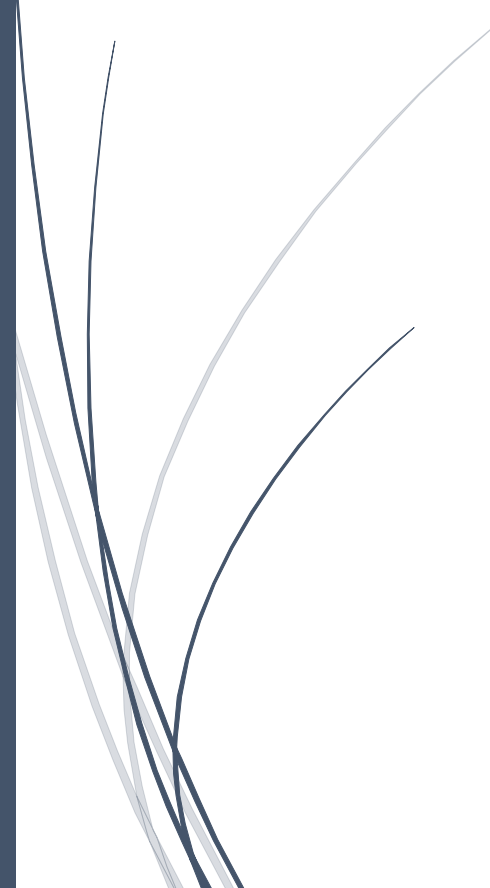


The logo for RADemics, featuring the text "RADemics" in white on a blue arrow-shaped background pointing to the right. The arrow is part of a larger blue graphic element on the left side of the page.

RADemics

# Cloud-Based AI Systems for Real- Time Academic Performance Monitoring in Higher Education

A decorative graphic consisting of several thin, curved lines in shades of blue and grey, originating from the bottom left and extending upwards and to the right, resembling stylized grass or reeds.

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# Cloud-Based AI Systems for Real-Time Academic Performance Monitoring in Higher Education

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## Abstract

The integration of cloud-based Artificial Intelligence (AI) systems in higher education has emerged as a transformative solution for improving academic performance monitoring and administrative efficiency. This chapter explores the role of AI in real-time academic performance analysis, personalized learning, and the automation of administrative tasks. By leveraging predictive analytics and machine learning models, AI systems provide timely insights into student engagement, identify at-risk students, and facilitate targeted interventions that enhance student success and retention. Furthermore, cloud-based AI technologies significantly reduce the administrative burden on faculty, automating tasks such as grading, student communication, and data management. This chapter also addresses the challenges associated with integrating AI into existing educational frameworks, including the need for seamless data interoperability, privacy concerns, and the ethical implications of AI-driven decision-making. As institutions increasingly adopt digital transformation strategies, the potential of AI and cloud computing to optimize academic processes and improve educational outcomes continues to grow. This research underscores the importance of AI-driven systems in shaping the future of higher education, with implications for student engagement, academic performance, and institutional efficiency.

Keywords: Cloud Computing, Artificial Intelligence, Predictive Analytics, Academic Performance Monitoring, Personalized Learning, Administrative Automation.

## Introduction

The rapid evolution of digital technologies has brought significant changes to higher education, creating new opportunities to enhance both student success and institutional efficiency [1]. One of the most transformative developments in this regard is the integration of cloud-based Artificial Intelligence (AI) systems [2]. These technologies enable institutions to manage vast amounts of data, analyze student performance in real-time, and provide personalized learning experiences [3]. Cloud computing offers the infrastructure needed to process and store data on a large scale, while AI models leverage this data to deliver insights that improve decision-making, reduce workloads, and enhance educational outcomes [4]. As a result, the convergence of AI and cloud computing in

higher education is reshaping how institutions monitor academic performance, engage with students, and optimize administrative functions [5].

AI-driven systems have proven to be particularly effective in real-time academic performance monitoring, offering significant advantages over traditional methods [6]. Conventional assessment techniques, such as periodic exams and assignment grading, often provide limited and delayed feedback [7]. In contrast, AI systems continuously track student progress across multiple platforms, such as Learning Management Systems (LMS) and other educational tools, offering up-to-date insights into academic performance [8]. By applying predictive analytics, these systems can identify patterns and trends in student behavior, enabling early intervention for students at risk of falling behind [9]. This real-time monitoring not only ensures timely support but also helps create a more adaptive and responsive learning environment, tailored to individual needs [10].

Personalized learning has become a key focus of AI applications in higher education [11]. By analyzing data from various sources, AI systems can create individualized learning paths for students, providing customized resources and interventions that address their unique strengths and weaknesses [12]. This personalized approach to education helps close learning gaps, supports student engagement, and improves retention rates [13]. AI models can suggest modifications to course content and delivery methods based on student performance, ensuring that the learning experience remains challenging yet achievable [4]. As AI continues to evolve, its ability to further personalize educational experiences holds great promise for enhancing both student outcomes and overall institutional performance [15].