Chapter 9
Exploring the Implications of Emerging Artificial Intelligence Technologies at Edge Computing in Higher Education

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ABSTRACT

In this chapter, the effects of cutting-edge artificial intelligence (AI) technologies at edge computing are examined in higher education. Edge computing offers a decentralized method of computing in which processing is done near the data source. Due to less network traffic, response times can be quicker. AI technology can be implemented at the edge to offer instructors and students intelligent and individualized services. The chapter addresses the advantages of edge computing and AI in higher education, including enhanced student involvement, better learning results, and simplified administrative procedures. It also looks at the difficulties of implementing AI at the edge, such as data privacy and security issues. To fully fulfill the potential of AI, the article's conclusion emphasizes the necessity for additional study in this field.

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INTRODUCTION

Higher education is one of several establishments that are progressively embracing artificial intelligence (AI) technologies. Artificial intelligence (AI) is becoming a crucial component of higher education due to its ability to improve teaching and learning processes (Kuleto et al., 2021; Doshi et al., 2023). Additionally, edge computing has become a promising strategy for AI to get past the difficulties posed by conventional centralized computing models. To reduce latency and enable quicker responses to real-time events, edge computing enables data processing to take place closer to the source of the data. Higher education institutions may significantly improve areas like personalized learning, student achievement, and operational efficiency by fusing AI with edge computing (Selwyn, 2022; Zeide, 2019). However, to make sure that they are used in an ethical, efficient, and secure manner, it is necessary to examine the implications of these new technologies for higher education. We will look at the current state of AI in higher education, the advantages of edge computing, and any potential risks or difficulties involved with the adoption of these technologies as we investigate the implications of new AI technologies at edge computing in higher education. The relevance of ongoing research and development in this field will be emphasized in our discussion of case studies and the future of edge computing and AI in higher education. This will improve student outcomes and progress in the field of higher education.

THE CURRENT STATE OF AI IN HIGHER INSTITUTIONS

The world we live in is rapidly evolving due to artificial intelligence (AI), and higher education is no exception. Artificial intelligence (AI) is becoming a crucial component of higher education due to its ability to improve teaching and learning processes. Researchers are looking into the potential for AI to customize education and increase student success rates, and institutions are already employing it to help jobs like student recruiting, academic counseling, and administrative procedures (Luan et al., 2020). AI applications, however, may face difficulties with conventional centralized computer models. Centralized approaches rely on sending massive amounts of data to a single place for processing, which can cause bottlenecks, excessive latency, and delayed response times. Furthermore, centralized models can present security and privacy risks because private information may be processed and stored on distant servers. These issues are particularly pressing when it comes to higher education, where data security and privacy are crucial factors.

Benefits Of Artificial Intelligence in Higher Institutions

The creation of individualized learning experiences is one of the key uses of AI in higher education. Institutions can examine student data and behavior using machine learning algorithms to offer individualized suggestions and interventions that encourage student achievement. For example, AI systems can review student performance data and suggest individualized learning paths, or they can identify students who are at risk and offer them focused interventions to increase their chances of success (Bonderud, 2021; Doshi et al., 2023).

The creation of intelligent campus systems is another area in which AI is being applied in higher education. To gather data on the campus surroundings, these systems use sensors and other data sources. They then use AI algorithms to optimize their operations and boost productivity. By analyzing data from