Chapter 11
Revolutionizing Education: The Transformative Power and Challenges of Artificial Intelligence in Learning

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ABSTRACT

This abstract examines the many facets of artificial intelligence, outlining its reach, development, and effects, with an emphasis on how it can be used in education. The study explores the evolutionary history of artificial intelligence, which has been fueled by exponential gains in computer power, data availability. The research looks at how AI is changing teaching, learning, and administrative procedures in educational institutions. The abstract explores the ways in which artificial intelligence is transforming education, outlining the nature, uses, implications, difficulties, and importance of AI. It explores how artificial intelligence technologies which include learning, reasoning and self-correction are revolutionizing traditional teaching methods and administrative procedures. It also facilitates automatic grading, data-driven decision-making, and lifelong learning. AI has significant ramifications that highlight its critical role in transforming educational paradigms internationally, helping both students and educators, despite its limitations.

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INTRODUCTION

Artificial Intelligence (AI) is a major force in the current technological innovation landscape, transforming economies, industries, and societies in general. AI is defined as the emulation of human intelligence processes by machines. It includes a wide range of subfields, from robotics and from processing natural languages and deep learning to computer vision. Driven by exponential increase in computer power, huge volumes of data, and improvements in algorithmic sophistication, its evolution over the past few decades has been characterized by impressive achievements. Artificial intelligence is a rapidly developing sector of technology that has the power to fundamentally alter human communication. Artificial intelligence is generating novel teaching and learning approaches in the field of education, which are being tested in multiple settings. When one hears the word artificial intelligence, they instantly picture a supercomputer. These robots have the cognitive and functional abilities of humans when sensors and other features are added. They can also exhibit adaptive behavior and have massive computing power. Supercomputers can even communicate with humans more successfully thanks to these features. In actuality, a number of films have been produced to highlight the promise of artificial intelligence. One such instance is how smart buildings control the music, temperature and air quality according on how the occupants perceive their mood. More uses of artificial intelligence (AI) in education have been found, extending beyond the traditional conception of AI as a supercomputer to encompass embedded computer systems. In fact, it is clear that artificial intelligence (AI) has impacted many facets of society, especially education, as the United Nations Educational Scientific and Cultural Organization (UNESCO) noted, citing examples such as instructional strategies, instruments and instructions. Because of alterations in the surrounding environment, artificial intelligence has also been functional in the fields of learning and administration. Wartman and Combs assert that the addition of artificial intelligence (AI) into instruction and learning is imperative, as changes in the professional and employment landscape are also impacting education. Artificial Intelligence (AI) has settled into an authoritative force in recent years, drastically altering many facets of modern civilization (Norvig & Russell, 2022). Because AI technologies are being widely used in the 21st century, our way of life, our jobs, and how we interact with the world around us have drastically altered. AI is now closely associated with innovation and development, from the easy incorporation of virtual assistants into our daily lives to the revolutionary developments in driverless cars (Haenlein & Kaplan, 2019). According to Nilsson (2014), artificial intelligence (AI) is a paradigm change in the way we understand and use computing power to mimic human intelligence (Nilsson, 2014). Artificial intelligence (AI) systems have demonstrated remarkable abilities in various fields such as natural language pro-