Chapter 1
AI-Based Sustainable E-Learning Strategies for an Eco-Friendly World: Transforming Education

Vikas Nain
https://orcid.org/0009-0006-9992-4191
Chandigarh University, India

Rajeev Prasher
Chandigarh University., India

ABSTRACT

The study proposes using AI in environmental education to promote sustainable learning that balances academic performance with environmental responsibility. To promote persistent learning. We will encourage continuous learning using these actions. This study promotes eco-friendly education. Schools must produce environmentally conscious people who can address resource depletion and climate change. Environmentally friendly, AI-powered e-learning systems may assist schools improve resource utilisation, energy efficiency, and customised learning. All of these are achievable with e-learning. Several AI-based technologies can tailor and engage education while lowering physical resources. Data-driven insights, adaptive learning, and immersive virtual worlds. AI may minimise carbon footprints and enhance resource efficiency in education, according to this study. Several research approaches are used. These research demonstrate artificial intelligence may enhance learning settings, but there are still challenges. Demand for qualified instructors and large AI model energy consumption.

I. INTRODUCTION

The combination of education that is attentive to the environment and artificial intelligence (AI) is a concept that has the potential to bring about big changes in the business. The implementation of this adjustment may prove to be advantageous for a company. It is at the same time when environmental concerns are developing that this potential is becoming available. At a time when the world is attempt-

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ing to address issues such as resource depletion, social inequality, and climate change, it is anticipated that the education sector will produce a generation of citizens who are environmentally conscious while also possessing the knowledge and abilities necessary to successfully navigate and lessen the impact of these issues. Simply put, the educational system has to educate a new generation of individuals who are cognizant of their impact on the environment (Aggarwal, 2023). By taking part in this activity, these individuals will have the opportunity to properly manage these challenges and reduce the harm that they cause. In order for the educational system to accomplish its objective, it is essential to cultivate a new generation of individuals who are ecologically concerned.

Machine learning systems that are both artificially intelligent and sustainable have emerged as an essential instrument in this endeavor. The fact that they are able to enhance instructional strategies and encourage the development of concepts that are ecologically sensitive is one of the probable explanations for this. The advancement of artificial intelligence has made it possible for educators to provide their students with learning opportunities that are individually tailored and more advanced. Students who participate in these activities not only maintain their interest in the topic at hand, but they also get a comprehensive knowledge of the fundamental ideas that underpin sustainability. The use of immersive technologies, which are intended to simulate the conditions that are encountered in the actual world, is one strategy that might be used on the situation. Adaptive learning systems adjust the materials that are provided in order to cater to the specific requirements of each individual student (Ayuyang, 2019). In addition, data-driven insights are used to shape the development of the curriculum. Each of these components has an impact on the program in some way.

It is possible that artificial intelligence may be able to assist with a wide variety of activities, one of which is the development of transdisciplinary methods that simultaneously emphasize the interconnection of social, economic, and ecological systems. Using technology to accomplish this goal is one way to do it. In light of this, it may be of assistance in ensuring that a broad variety of business disciplines use methods that are ecologically respectful. A consequence of this is that things are occurring in the manner that they are. There is a growing awareness of the need of instilling in children a sense of environmental consciousness and training them to be responsible stewards of the land. It is necessary to use a combination of education and technology in order to accomplish this objective. Because it is getting more difficult to accomplish these goals without the assistance of technology, this is the reason. As a result of this explanation, we are now doing research on the possible implications that artificial intelligence may have on the approaches that are used in places of education. Through the implementation of this course of action, the goal of establishing a future that is less detrimental to the environment is being accomplished! Throughout the course of this investigation, we will investigate new approaches to education that make use of artificial intelligence in order to foster sustainability. In this section of the essay, we will investigate the ways in which various techniques influence the results of learning and the ways in which these approaches contribute to the greater endeavor to build a world that is gentler on the environment. The method by which these gifts are made will be the primary focus of our attention. A representation of the ways in which artificial intelligence (AI) is being integrated into educational institutions is shown in Figure 1. The promotion of future sustainability, which will have a less influence on the environment, is being accomplished by this occurrence. Aside from the phrase “Artificial Intelligence in Sustainable E-Learning” serving as the primary focal point of the picture, it is surrounded by six essential components that demonstrate how AI has the potential to contribute to the creation of a learning environment that is less harmful to the environment. The first advantage that artificial intelligence brings to the realm of online education is an increase in the efficiency with which energy utilises