Chapter 5
IoT for Smarter Students in Smarter Personalized Learning: Higher Education Context

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ABSTRACT

The traditional classroom is moving to rapidly evolving technologies that assist in improving teaching and learning in the 21st century and prepare students for the future workforce. The Internet of Things (IoT) has changed the betterment of education by assisting lecturers to administer it according to every student's needs. This chapter explores the avenues of IoT in education, including its applications, merits, and demerits. The chapter introduces the IoT and provides an in-depth analysis of how it is significant in education, and its current status in education is also elaborated. Applications of IoT are crucial and may be used to design smart classrooms, such as the integration of mobile technology and sensors. The merits of adaptive learning are that it can be accessed easily, provides fast feedback from the lecturers, and student engagement is also increased. For smart classrooms to be put in place, it is important to have the relevant infrastructure; lecturer development

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through short courses, workshops, and seminars; creation of relevant curriculum content; and implementation procedures. The convenience of IoT-based adaptive learning, such as increased student achievement, lecturer high remuneration rates, and increased lecturer satisfaction, is also discussed. The chapter also intends to examine the issues and challenges that need attention in IoT integration in higher education setups. The lessons learned from the accomplishment of IoT-based adaptive learning deployments are also stated. The importance of strategising on how to handle the challenges in connection with equity and access is highlighted to make sure that students at large have an equal chance to benefit from this latest technology development.

INTRODUCTION

IoT has ushered in a paradigm shift in education circles. Lecturers and students can now virtually interact, share ideas, and collaborate in real-time regardless of geographic separation. IoT integrates several hardware and software packages to create a functional internet-based network. Individual components of the system communicate via electronic sensors and cloud-based infrastructure. This chapter endeavors to elaborate on the role of IoT in improving the quality of the education delivery system and some inherent drawbacks like financial challenges faced by some academic institutions in securing required gadgets and software, and obtaining the required technical skills and aptitudes (Fitria & Simbolon, 2023; Abdul-Qawy, Pramod, Magesh, Srinivasulu, 2015).

IoT technologies, coupled with artificial intelligence (AI), have the potential to provide a more interactive and student-centred learning approach. Students are allowed to virtually interact with learning material and manipulate virtual objects as though they were real and physical. This fosters a more practical approach to learning, divorced from more theoretical traditional teaching and learning methods. Virtual platforms allow students to engage in situations that are difficult to partake in in real life and to carry out experiments they would not be able to in real life due to challenges like a lack of finance, a lack of physical apparatus, or consumables, among many other factors. IoT facilitates the creation of learning experiences and programmes specifically for particular students based on their unique needs and circumstances. This ensures that each student is allowed to learn at their own pace and get required assistance from chatbots in real time. Lecturers can also use this technology to mark attendance registers, track the progress of each student, design appropriate assessments, and give the much-needed, timely feedback (Embarak, 2022).