Chapter 10
Behavior-Based Computational Intelligence on the Web for Integrated Educational Systems

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ABSTRACT

Intelligent learning environments have been made possible by the rapid expansion of online technologies and the introduction of computational intelligence, which have completely changed traditional educational institutions. The use of behavior-based computational intelligence to improve educational systems on the web is examined in this research. Algorithms with intelligence may adjust feedback, evaluation, and content delivery to each student's unique needs by continuously observing how they learn. Personalised learning is made possible by the study's use of machine learning techniques, including reinforcement learning and neural networks, to model and

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predict student behaviour. High-quality education is now accessible to a wider audience because to the integration of these systems on web-based platforms, which offers scalability and accessibility. Our research shows that when instructional materials are customised to each learner's unique behavior, learner engagement, retention, and academic achievement significantly increase.

INTRODUCTION

At the moment, the primary goal of artificial intelligence-based classroom teaching and learning behaviour analysis is the creation of intelligent teaching behaviour recognition and analysis system tools. These systems rely on speech data from classrooms for recognition, with classroom nonverbal behaviour still receiving relatively little research. Although there is currently a dearth of quantitative and practical research on classroom teaching behaviour analysis theory, classroom teaching behaviour theory research focusses on examining classroom teaching styles and teaching evaluation indicators (Boren Gao et al., 2021). Because of the way things are now set up, classroom education mostly relies on manual observation to record and describe classroom activity. And learning behaviour analysis is mostly limited by the observers' subjective consciousness and attention span, and has resulted in a major consumption of both people and material resources. Consequently, no guarantee can be made regarding the objectivity and timeliness of the analysis process or its results. Recent studies indicate that the growth of online education in India is being driven by factors at the national level(Arun Kumar et al.,2022).

In the years to come, it is expected that this business will continue to flourish with active support from all levels of government. The Middle East is one of the last continents to use the internet for education. According to earlier study, the primary obstacles to the growth of online education in Middle Eastern nations include low internet penetration, limited public support for online learning, and a lack of Arabic-language online educational materials (Callo, E. C.,et al., 2020). Since students' demands are constantly evolving, educational programs have evolved to meet those needs. Additionally, as more public and private institutions adopt online learning, learning platforms with more affordable training and course fees are being developed. To apply these new teaching techniques, universities and colleges must make use of a cloud technology called “online proctoring”. Online proctoring programs also referred to as remote proctoring use webcams and internet connections as digital tools to monitor and control student conduct during exams (Arnà, S.,et al., 2021).

So avoiding and detecting any possibility of wrongdoing. Exam-related behaviour from students is recorded and examined by OLPs using an online platform. Furthermore, in order to authenticate the examinee and verify that they are the actual

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