

# Chapter 8

## Smart Education Systems Using the Internet of Behavior–Based Computational Intelligence

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### ABSTRACT

*Smart education systems are changing quickly thanks to the Internet of Behavior (IoB) and Computational Intelligence (CI). Innovating, personalised, and adaptive learning environments through the combination of IoB and CI is the focus of this paper. Deep insights into student engagement, learning preferences, and performance are provided by the IoB, which collects and analyses behavioural data from a variety of digital and physical interactions. Computational intelligence uses this data to customise educational interventions and content to the needs of specific*

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*learners. It includes methods like machine learning, neural networks, and pre-dictive analytics. IoB and CI together enable personalised feedback, enable early detection of learning difficulties, and allow for real-time adaption of teaching strategies in smart education systems. This integration maximises group dynamics, fosters effective peer learning, and enhances collaborative learning. It not only facilitates the implementation of behavioural nudges to support positive educational practices.*

## **I. INTRODUCTION**

The development of intelligent teaching behaviour recognition and analysis system tools is currently the main focus of classroom teaching and learning behaviour analysis based on artificial intelligence technology. These systems primarily use classroom speech information as the basis for recognition, while there is still a slight lack of analysis in the area of classroom nonverbal behaviour. While quantitative and practical research on classroom teaching behaviour analysis theory is still relatively rare, research on classroom teaching behaviour theory focuses on investigating classroom teaching modes and teaching evaluation indicators (Boren Gao et al, 2021). As a result of the current setup, which primarily relies on manual observation to document and annotate classroom behaviour, classroom teaching and learning behaviour analysis has resulted in significant resource consumption, both human and material, and is primarily constrained by the observers' subjective consciousness and attention span. As a result, there is no assurance regarding the impartiality and promptness of the analysis procedure or its outcomes. According to recent studies, India's national-level variables are driving the expansion of online education in the nation. With all levels of government actively supporting this growth, it is anticipated that this industry will continue to expand in the years to come. The Middle East is among the last regions to adopt online learning. The main barriers to the expansion of online education in Middle Eastern countries, according to previous research, are low internet penetration, poor public regard for online learning, and a dearth of Arabic-language online educational resources (Callo, E. C , et al.,2020). Educational programmes have changed over time to accommodate students' changing needs, and the increasing use of online courses by both public and private institutions is encouraging the creation of learning platforms with lower training and course costs. Universities and colleges must use a cloud technology known as "online proctoring" in order to implement these new teaching methods. Using webcams and internet connections, online proctoring programmes, also known as remote proctoring, are digital methods of keeping an eye on and managing student behaviour during exams (Arnò, S. et al.,2021). So, averting and identifying any potential for malpractice. OLPs use an online tool to log and examine exam-

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