


# Chapter 17

## Transforming Student Assessments in the Era of Machine Learning: Balancing Innovation and Ethics

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### ABSTRACT

*Machine learning algorithms are now being used to improve personalised student assessments in higher education. This chapter examines the benefits and ethical considerations of using these algorithms to develop personalised and customised testing experiences. Through the analysis of vast datasets, machine learning algorithms may offer useful insights into student progress and identify specific areas that require work. This allows educators to customise their teaching methods to meet the individual needs of each student. Nevertheless, the implementation of these technologies gives rise to ethical considerations pertaining to privacy, bias, and openness. This chapter examines the difficulties associated with machine learning in personalised student assessments and proposes creative methods to ensure fair and responsible use. The objective of the discussion is to find a middle ground between utilising the potential advantages of these algorithms and upholding ethical principles, thereby promoting a more efficient and*

DOI: 10.4018/979-8-3693-8292-9.ch017

*inclusive learning environment in higher education.*

## **1. INTRODUCTION**

### **1.1. The evolving landscape of student assessment in higher education**

Recent innovations in assessment technology have boosted the assessment of students in higher learning institutions from the old, fixed mental assessment styles to more flexible assessment techniques (Boud, 2016). Current assessment methodology focuses on the formative assessment accompanied by feedback throughout the learning process (Black, 2009), complemented by the assessments based on real-life situations (Gulikers, 2004). Digital assessment methods provide timely feedback, improved data management, valuable Skills for the 21<sup>st</sup> Century (Timmis, 2016) that are important in enhancing the contemporary knowledge assessment practices (Care, 2018).

The Covid19 unleashed the use of digital assessment, with the incorporation of an adaptive testing and online proctoring (García-Peñalvo, 2021). Cognitive technology in particular has brought a tremendous change in assessment through computerized scoring and multi-faceted analysis (Yesilyurt, 2023), real time feedback that is formative (Onesi-Ozigagun, 2024). However, these advancements are problematic with regard to the ethical considerations of data protection, and algorithm censorship and was (Bu u, 2024). They also argued that, to be effectively implemented, such innovation has to adhere to key points of ethical responsibilities including fairness, refection, and student privacy (Aler Tubella, 2023) (Luckin, 2016).

#### **1.1.1 Current Challenges and Research Gaps in Educational Assessment Literature**

Recent studies in ML educational assessment identify several significant deficiencies as follows. The literature is scattered and contains only fragmented information about several specific solutions rather than providing overarching information about general approaches. Research is primarily focused on technical aspects of issues and addresses ethics as an addendum to or an afterthought, so the gap between theory and practice is observed. There is poor evidence-based practice; most of the published work is based on short term findings and cross-sectional comparisons. Concerning integration with existing structures of education, specific problems continue to be inadequately discussed. Moreover, as it is understood that there could be bias in the ML systems, there is a dearth of literature on how it might be diagnosed nor are there many solutions addressing the problem in the learning environment. This kind of program is developed to suit the western student's inadequate consideration of diversity.

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