

# Chapter 8

## Fostering Inspirational Learning Through AI-Enhanced Formative Assessment: Strategies and Challenges in Higher Education

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### ABSTRACT

*This chapter examines the transformative potential of AI-enhanced formative assessment in higher education, focusing on fostering inspirational learning experiences. The authors explore how artificial intelligence can revolutionize traditional assessment practices, enabling more personalized, efficient, and effective learning environments. The chapter discusses benefits and challenges of implementation, including potential improvements in student engagement, motivation, and academic achievement. It analyzes AI's role in facilitating real-time feedback, automating grading, and enhancing teacher-student interactions. A comprehensive review of the current state of AI-enhanced formative assessment in higher education is provided, highlighting best practices, strategies, and challenges. The chapter concludes by outlining future research directions, emphasizing collaboration among educators, policymakers, and technologists to harness AI's potential in inspiring and empowering learners.*

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## INTRODUCTION

Higher education is experiencing a fundamental shift toward more personalized and effective learning experiences, driven by technological advances. As traditional assessment methods evolve, formative assessment has emerged as a key tool for enhancing student learning through ongoing feedback, rather than relying solely on end-of-term evaluations.

Artificial Intelligence (AI) is transforming formative assessment practices by providing timely, personalized feedback to students and valuable insights to educators. Luckin and her colleagues (2016) frame AI as a “more capable partner” in education, offering adaptive scaffolding within the “Artificial Intelligence for Education” (AIED) model. Recent empirical studies support AI's effectiveness in educational settings. Winkler and Söllner (2018) found that AI-powered chatbots improved student engagement and performance through instant feedback. Similarly, Barana et al. (2019) demonstrated that AI-enhanced mathematics platforms significantly improved students' problem-solving abilities.

By incorporating machine learning algorithms, natural language processing, and data analytics, AI-enhanced formative assessment addresses key challenges in traditional methods. These include providing individualized feedback efficiently, tracking real-time progress, and adapting to diverse learning needs. This integration creates a dynamic assessment ecosystem that promotes inspirational learning while reducing the administrative burden on educators.

## THEORETICAL FRAMEWORK

### Understanding Formative Assessment and Summative Assessment

Formative assessment is a crucial element in the learning process, providing ongoing feedback to both learners and instructors. Black and Wiliam (1998) define formative assessment as encompassing all activities undertaken by teachers and students that provide information to be used as feedback to modify teaching and learning activities. This process helps to close the gap between current understanding and desired goals (Sadler, 1989). Formative assessment strategies can include questioning, self-assessment, peer assessment, and teacher observation (Wiliam, 2011). These methods allow for continuous monitoring of student progress and enable timely interventions to support learning. For example, the traditional formative methods that can be used in accounting courses are as follows:

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