Chapter 6

How Innovative Technologies Are Improving the Delivery of E-Assessment in Higher Education

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ABSTRACT

The impact of the swift evolution of technology has rippled across all areas of society with technological developments presenting solutions to some of society's greatest challenges. Within higher education, technology is welcomed with the necessary caution of a sector that is responsible for educating and empowering the future workforce. The progressive, and more recently accelerated, digitalisation of education causes the core practices and procedures associated with teaching and learning, including assessment, to be delivered in innovative formats. Technology plays a central role in the delivery of e-assessment, widening its possibilities and broadening its methods and strategies. This chapter aims to examine how innovative technologies are shaping and improving the delivery of e-assessment in the context of higher education. More specifically, it examines the role of artificial intelligence, gamification, learning analytics, cloud computing, and mobile technology in how e-assessment can be delivered.

INTRODUCTION

Assessment is a core aspect of learning, allowing teachers to have a depiction of what knowledge the students have acquired and what aspects of the content need further support. It determines what parts the course are more important and on which resources the students will invest most of their time. With the emergence of new learning environments, assessment practices need to be reinvented (Baleni, 2015). In the context of online learning it becomes fundamental to consider assessment not only in terms of the learning outcomes of the students with concern to content, but also regarding skill acquisition (Cerezo et al., 2020). Moreover, assessment is instrumental in underlining the importance of applying and using knowledge to complete intricate tasks that focus on problem solving (Company et al., 2017).

E-assessment is more cost effective (James, 2016), it allows personalised and adaptive testing (Fluck et al., 2009), it can reach a higher number of students (Jordan, 2009) and be delivered more often (Sclater, 2007). Also, it enables grading automation (Charteris et al., 2015; Jordan, 2013) and the exchange of questions among teachers in question banks (Sindre & Vegendla, 2015). At the same time, e-assessment challenges can pertain to the technological infrastructures that are available (James, 2016), to the insufficient security of e-exams (Miguel et al., 2014), to the difficulty that the assessment of open questions (Heinrich et al., 2006) and high-order thinking constitute (Fluck et al., 2009) and to the question of validity of certain types of electronic assessment (Cano & Ion, 2017). Moreover, inadequate digital skills and the necessity to guarantee training can pose an obstacle (Cano & Ion, 2017). It is essential to identify the level of students' digital literacy to ensure that they have the ability to master digital resources (Miranda et al., 2018).

Assessment should consider the learning objectives of the students and assist them to mature the skills that they will require, on the long-term, to become active members of society (Alruwais et al., 2018). Some of the factors that influence e-assessment's success include authenticity, consistency, transparency, practicability and accessibility (Appiah & van Tonder, 2018). E-assessment's effectiveness is equally contingent on accounting for a multifaceted approach involving aspects of human, managerial, social and technological nature and also data collection (Daly et al., 2010).

E-assessment activities, both formative and summative, can be developed with the assistance of a panoply of technologies, such as e-assessment systems, e-portfolios, online quizzes, gamification, Web 2.0 tools such as wikis or blogs. The rate at which e-assessment is evolving can lead teachers to feel overwhelmed in trying to be updated with all existing possibilities (Benson & Brack, 2010). This chapter aims to examine how innovative technologies are enhancing the delivery of e-assessment. It begins by presenting an overview of e-assessment in the context of higher education and the

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