Chapter 8
Assessment of Higher Order Thinking Skills:
Digital Assessment Techniques

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ABSTRACT

Nowadays students have desires for practical, individualized learning, immediate feedback, exciting and engaging instructional contents, advanced technology, and most importantly relevant information. As a result, most institutions are now adopting digital assessment to meet the students' demand. This chapter presents several digital assessment techniques and the respective tools. Challenges and opportunities for several types of digital formative and summative assessments are highlighted.

INTRODUCTION

The acquisition of knowledge or skills via study or experience is popularly referred to as learning. Assessment is the core backbone of the learning process, and the central goal of assessment is to support and enhance learning. Modern technologies allow educators to use sophisticated tools to track and assess both student's and educator's performance and accelerate communication between peers and educators. Digital tools are designed to store students' digital footprints, in doing so, they record and monitors student educational growth and development. The process is the same as sailing a ship, where the teacher acts as the sailor by constantly adjusting course. In particular, learning goals are set, but the actual path responds to the needs of the individual students. The term digital assessment is sometimes referred to as 'e-assessment' 'on-screen assessment', 'computer-based testing', 'computer-assisted or aided assessment', 'technology-enhanced' and 'technology-enabled assessment'. This chapter opts to use digital

assessment which refers to the use of digital technologies to enhance formal or informal educational assessment for both formative and summative purposes (Timmis, Broadfoot, Sutherland, & Oldfield, 2016). Traditionally, there two main assessment techniques (i.e., formative and summative assessment) that have been extended to the digital world. The distinction between the two is mainly based on two factors: purpose and timing.

According to Spector (2015), formative assessments are those sets of assessments undertaken during or for learning. This type of assessment stresses the importance of initiating judgments about students' progress that then affects the following flow of instruction (Bennett, 2011; Ecclestone, 2010). Cauley and McMillan (2010) argued that "formative assessment is a planned process to the extent that the teacher consciously and continuously receives data of student performance and then uses this information productively, resulting in increased student motivation and engagement" (p.1). Summative assessments stress on judgments and evaluations based on how well students perform at the end of the semester (Ecclestone, 2010). In this view, summative assessment is usually carried out at the end of an instructional unit when achievements and grades have been reported. Technically, it entails systematic processes to make sure quality is assured (Harlan & James, 1997), or simply evaluating learning progress against stated standards e.g., registering and recording of student overall performance in a systematic manner such as CGPA (Potter, 2017).

Assessment, in general, is an integral part of the teaching concept, strictly determine whether or not the aims and objectives in course outlines are being met. As assessment affects the decision about curriculum, instructional needs, and student's grades, it's quite important for institutions to consistently evaluate the method of assessment they adopted. One of the main challenges of traditional teaching and learning activities is the assessment as it requires much time and feedback is giving to students when they don't have the chance to improve in the course anymore. Assessment requires deep analysis of the whole learning process traditionally but recently with the help of technology, learning analytics are quite useful nowadays in the digital learning environment as it collected data automatically, analyze it and give a vital report to the teachers and learners for improvement (Enrica, Teresa, Veronica, & Pierpaolo, 2015). In this era where Generation Zer dominate the higher institution, so many institutions have been adopting digital exam and assessment via different learning management systems. Generation Zer will hereby refer to as Gen Zers or Generation Z in this chapter.

These Gen Zers students always desire practical, individualized learning, immediate feedback, exciting and engaging instructional contents, technological advanced and most importantly relevant information (Jennifer & Teresa, 2018), and according to (Tal, Tali & Eynat, 2017) the students communication via the LMS system are quite low as compared to external communication channels like social networks, they relied more on instructional video materials than reading and supplementary materials, they communicate efficiently with instructor via emails rather than posting publicly on forums, the summaries of the lectures are quite effective, the assignments taking were found as most significant and contributing learning resources, and most importantly they are motivated, expresses high satisfaction and would like to engage more in online courses.

Tal, Tali and Eynat (2017) applied the data mining technique whereby they collected the student's activities automatically via the LMS and analyze the data and perceptions were also examined quantitatively. Their results revealed that engaging instructional video materials lead to better engagement of students in quizzes, lectures, communication, and assignment and this imply that the digital summative and formative assessment method is not only enough for the Gen Zer. Pearson report (2018) mentioned that Gen Zers always like to figure out problems on their own first via the internet, books or classmates/

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