

# Chapter 11

## Electronic Marking and Educational Assessment: A Case of Makerere University in Uganda

Walimbwa Michael  
Makerere University, Uganda

### ABSTRACT

*Pervasiveness of technology in the digital age has affected education generally and is fundamentally transforming assessment, causing changes in traditional educational settings, like learning taking place anywhere, anytime and in real-world context. In such an environment, emphasis is put on what is to be seen as effective assessment in a smart learning environment (SLE). Through a case chapter examines the process of electronic marking and how it enhances smart learning practices. Drawing on the technology acceptance model, the meaning and process of e-marking in enhancing smart learning is presented. Features and process of e-marking and its perceived benefits and barriers are described. From the reported experiences of engagement in the e-marking process; it is found out that e-marking is increasingly becoming important and dependable in enhancing smart learning. Findings also indicate that in contexts where e-marking is thriving, it started as a small project, with a few scripts marked electronically and then gradually gets up scaled into a full practice. It is concluded that e-marking is an intervention that is key in the assessment of large classes in large classes, that will contribute to the attainment of the Sustainable Development Goal number four- ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all.*

### SMART LEARNING, ELECTRONIC MARKING AND INNOVATIVE ASSESSMENT

Some of the most popular themes in education in modern times are smart learning environment (SLE) and innovative assessment. As a term, SLE does not have a completely clear and universal definition as yet, due to the diversity in the technologies around contexts and its recent incorporation into the digital environment. However, it does summarize a set of crucial components. SLE is defined by the

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International Association for Smart Learning Environments as an environment that features the use of innovative technologies and elements that allow greater flexibility, effectiveness, adaptation, engagement, motivation and feedback for the learner (Spector J., 2014). Smart learning has its foundation on the availability of smart devices and intelligent technologies in a given context. These resources effectively used creates real digital learning environments that offer convenience to learners and keep pace with the changing demands of the digital age. To realize that, engagement in innovative assessment, an assessment that moves beyond and above the conventional assessment is essential. Conventionally, it is a normal practice to find many individual assignments assessed using red pens, which takes time and is prone to subjectivity and related issues such as human error. With the fast development of digital technologies, assessment processes that are adept to technologies are becoming more effective but complex, thus requiring constant modifications and adjustments in approach so as to meet the 21<sup>st</sup> century learning practices in a digital era.

Smart learning has a foundation on two different types of technologies- smart devices and intelligent technologies (Gros, 2016). Smart devices refer to objects that display pervasive computing properties, including (although not necessarily) artificial intelligence; like the internet of things, wearable technology in the form of an accessory such as glasses, a backpack, or even clothes. Intelligent technologies on the other hand refer to learning analytics, cloud computing and artificial intelligence capabilities, and are vital in capturing valuable learning data that can effectively enhance the development of personalized and adaptive learning (Mayer et al., 2013; Picciano, 2012). For a practitioner to effectively capture these, there is need for innovative assessment, and it is these technologies combined that contribute to electronic making (e-marking). E-marking, also known by other names like onscreen and digital marking, is the use of smart devices and intelligent technologies and tools specifically designed for marking purpose (Moir, 2011). These technologies capture attributes that may not be necessarily captured in the conventional manual marking process where usually red ink pens are used to put ticks, crosses, comments and award marks on a script. E-marking involves the use of computer hardware and software to perform all these activities, the computer systems including marking and data analysis of a scripts thus making the marking process itself smart and therefore enhancing a smart learning.

Smart learning is characterized by a three model criteria including context, support and the adaptive user interface. The context awareness takes into account the learner's situation or the context of the real-world environment in which they are located. There is need to be supportive of the learner and their digital and real-world contexts. The adaptive user interface focuses on ways of presenting information to meet the personal factors like learning preferences and learning status (Zhu, Yu, & Riezebos, 2016). SLE attributes enable the e-marking to comprehensively capture them in with innovative assessment approaches. Additionally, a more detailed description of this criteria that enable innovative assessment to take place include:

1. **Mobile:** The continuousness of computing while users move from one position to another meaning that assessment can be done while on the move.
2. **Awareness of Location:** The identification of user's location means that it is possible to locate where and when the assignment was done.
3. **Interoperability:** The interoperable operation between different standards of learning resources, services, and platforms meaning that assessment can cover multimedia attributes making it more comprehensive.

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