Using Digital Technology in Transforming Assessment in Higher Education Institutions beyond COVID-19

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Abstract

Purpose: This paper explores the dominant practices by integrating the use of technology to enhance assessment practices to better respond to the learning needs of the 21st century and the imperatives of the 4th industrial revolution. **Objectives:** 1) To explore how digital assessment could support diagnostic assessment in post-COVID-19 assessment practices. 2) To develop a digital assessment tool that supports the uptake and appropriate use of diverse digital assessment techniques. 3) To strengthen lecturers' awareness of Constructive Alignment and implement it in digital-assisted assessment to promote the integration of graduate attributes in students. **Method:** The paper adopted the three elements of criticality, reflexivity, and praxis to address the use of digital technology to transform assessment of and for student learning within an institutional context. Criticality was used to provide a constructive reflection aimed at transforming the context; reflexivity enabled introspection and self-awareness regarding assessment as a pedagogical component that enhances student learning, and praxis helped to relate theories, concepts, and ideas to practice. The three elements informed the development of the model for enhancing and transforming digital enhancement assessment at the University of Namibia. **Findings:** The main findings revealed that higher education institutions could benefit from the forced COVID-19 migration to digitally-enabled assessment. The paper also revealed that for the digitally enabled assessment to be enhanced it requires collaboration between various institutional stakeholders. **Conclusion:** The paper concluded that there are opportunities for further collaboration among different institutional departments such as the faculties, quality assurance, innovation in learning and teaching, and research units, towards investigating, improving, and implementing new ways of as-

sessing that are forward-looking and more supportive of student learning beyond their university careers.

Keywords

Digital Assessment, Reflexivity, Praxis, Criticality, Constructive Alignment, Integrative Assessment

1. Introduction

Assessment is a backbone of student pedagogic access that has predominantly been used for summative purposes. The COVID-19 pandemic caused global disruptions that forced higher education institutions to adopt new ways of teaching and learning as well as assessment of and for student learning. From the Constructive Alignment perspective, assessment is one of the key components of the teaching and learning process together with learning outcomes and teaching-learning activities. One of the most pivotal components of the curriculum and its delivery is the intended learning outcomes (and unintended but desirable) against which all other components ought to be aligned. But is this the case? Literature offers some answers to this question.

Assessment is important to student learning because it is through assessing students that we determine the effect of our teaching on students' attainment of the intended learning outcomes (Wiliam, 2011). According to Boud and Falchikov (2007), it is assessment and not teaching that has the most influence on student learning whereby assessment guides students' attention to what is of value in the course by acting "as an incentive for study" (p. 3). Studies carried out on assessment and what it means in higher education has discovered that the dominant discourse of assessment as referred to or represented in policy documents hardly portrays assessment as a tool primarily for supporting learning and teaching. In fact, studies have found that "what influenced students most was not the teaching but the assessment" whereby "what they paid attention to, how much work they did and how they went about their studying—as being completely dominated by the way they perceived the demands of the assessment system" (Gibbs & Simpson, 2005: p. 4). In simple terms, assessment dictates what students learn and which areas of the curriculum they put more effort in.

Essentially, students learn to the test, whereby they study specifically to stand the best chance to pass with good marks, rather than to learn and apply the knowledge to future contexts. Boud and Falchikov (2007) argue that the dominant practices of assessment in higher education seek students' demonstration of current knowledge, thereby "failing to prepare them for the rest of their lives" (p. 3) to apply what has been learned in situations outside the classroom.

Statement of the Problem

Assessment is therefore both a contentious and critical area of teaching and learning in higher education. It is contentious because it has proven to exert

more influence on student learning in comparison to teaching and curriculum design. Boud (2007: p. 21) puts it well when he claims that assessment "provides an agenda more persuasive than a syllabus or course outline and it, therefore, has a powerful backwash effect on all teaching and learning activities". This scenario is contrary to constructive alignment that puts emphasis on the learning outcomes and where assessment is only one of the activities for monitoring and informing on student progress towards attaining the learning outcomes. Although this notion of assessment as a means of measuring student fulfilment of learning outcomes should also be questioned, given how some see it as part of the quality assurance and enhancement movement (Bloxham & Boyd, 2007). Therefore, the purpose of this paper is to explore the dominant practices by integrating the use of technology to enhance assessment practices to better respond to the learning needs of the 21st century and the imperatives of the 4th industrial revolution.

Objectives of the Paper

This paper is guided by the following objectives:

1) To explore how digital assessment could support diagnostic assessment in post-COVID-19 assessment practices.

2) To develop a digital assessment tool that supports the uptake and appropriate use of diverse digital assessment techniques.

3) To strengthen lecturers' awareness of Constructive Alignment and implement it in digital-assisted assessment to promote the integration of graduate attributes in students.

2. Methodology

This paper employed Stierer's (2008) analytical domains of criticality, reflexivity, and praxis. Similar to Magesa and Josua (2022), this study adopted a contextual reflection to address the use of digital technology to transform the assessment of and student learning within the context of the University of Namibia. Going beyond simple description, criticality deeply engages the context by providing constructive reflection aimed at transforming the context. Secondly, reflexivity enables introspection and self-awareness (Stierer, 2008) regarding assessment as a pedagogical component that enhances student learning. Lastly, according to Stierer (2008), praxis helps to relate theories, concepts, and ideas into practice. Employing these elements helps to guide the transformation process of moving towards meaningful use of digital assessment.

3. Literature Review

3.1. Defining Assessment

The concept assessment has been defined differently in different contexts and depending on the prevailing philosophical views of education and policy discourses. There are two dominant ways namely; assessment of learning or for learning. The two definitions are representative of these two approaches is use-

ful. Bloxham and Boyd (2007: p. 15) define assessment of learning as a process of "making judgements about students' summative achievement for purposes of selection and certification". Assessment for learning on the other hand is "formative and diagnostic that provides information about student achievement which allows teaching and learning activities to be changed in response to the needs of the learner" (Bloxham & Boyd, 2007: p. 15).

The difference between the two definitions also reflects the types and purposes of assessment. Assessment of learning is usually summative, takes place at the end of a course or learning unit, and renders itself more to inform accountability and quality assurance questions. Assessment for learning worries itself with learning and informs teaching by helping educators to reflect on the impact of teaching and how well it is helping students to learn, and thus make appropriate action. Both types of assessment inform action, with the only difference being on whether the intervention is corrective (formative assessment) or judgmental (summative assessment).

3.2. Types and Purposes of Assessment

Traditionally, the types of assessment common in education have been the diagnostic, formative, and summative assessment. These types of assessment typically measure students' knowledge and levels of understanding for various purposes and at different stages of learning, and they are usually teacher-controlled methods.

3.2.1. Diagnostic Assessment

Diagnostic assessment has been used at the beginning of a course or teaching activity to "identify gaps in specific knowledge" and "identify deficiencies in current understandings" (Crisp, 2012: p. 39). At the University of Namibia, diagnostic assessment has been practised rather informally as part of the teaching practice or has been used outside pedagogical contexts, such as by student admission or placement bodies. For example, an assessment of elder students entering the university called Mature Age Entry is diagnostic in nature but it is applied summatively to make decisions on which programmes students should be placed. Therefore, diagnostic assessment, though referenced in theory in policy documents, and practised by some, mainly fulfils the purpose of summative assessment.

True diagnostic assessment results should not be used to decide if students should enter a given programme or not. Doing this goes contrary to the notion of the massification of higher education by continuing to block out social groups traditionally deprived of higher education opportunities. Ideally, all students taking a diagnostic assessment should be allowed into the programme, and the assessment results be used to inform educators' pedagogical strategies and students' learning support they need to address the identified weaknesses and thus to aid pedagogical access. In essence, diagnostic assessment can be a useful tool to promote assessment for learning by signaling to students that "identifying

one's existing capabilities is a critical step towards being a self-regulated learner and establishing control over the learning environment" (Crisp, 2012: p. 40).

3.2.2. Formative Assessment

Like diagnostic assessment, formative assessment also has a long tradition of usage in higher education. Formative assessment takes place during the process of teaching and learning for a developmental purpose and is designed to help the students to learn more effectively (University of Namibia, 2014). The key distinguishing characteristic of formative assessment is therefore its purpose, being to "contribute to student learning through the provision of information about performance" through feedback (Yorke, 2003: p. 478).

Additionally, formative assessment can be formal whereby students carry out assessment activities "with reference to a specific curricular assessment framework" (Yorke, 2003: p. 478), while informal formative assessment involves activities that students carry out while learning where they receive feedback informally from teachers, their peers or even through the feedback given to fellow students. Formative assessment traditionally tends to take the form of tests and assignments with the dual purpose of offering student feedback, as well as to provide continuous assessment grades to be used as end of course marks that enable students to qualify for summative exams.

3.2.3. Summative Assessment

The traditionally most used types of assessment are, as hinted above, diagnostic, formative and summative assessment, the latter being the "most valued" by both students and educators in education systems that value high stakes assessments to make judgements on student progress. According to Crisp (2012: p. 40), summative assessment is typically used for "progression and certification purposes" by indicating "the extent of a student's success in meeting the assessment criteria used to gauge the intended learning outcomes of a module or a programme" (University of Namibia, 2014: p. 4).

The high value assigned to summative assessment in some higher education institutions and the education system in Namibia in general says a lot about the societal values and views of education. To value the assessment that is used to make judgements about student progression and certification says that the society sees education as a commodity that is to be acquired and used as currency to trade for jobs and income. If education and learning was valued for its sake, then a lot more emphasis would be put on assessment for learning such as formative and diagnostic assessments. As mentioned earlier, diagnostic assessment has been used for summative purposes like to make decisions on who should be admitted to a programme or not. Similarly, formative assessment has also been valued just as far as it enables students to qualify for summative assessments.

Also, it could mean that fundamental changes in assessment practises would require changes in educational philosophies, societal values, and ideologies. This would not happen overnight, but there are opportunities to reform assessment

practises at the University of Namibia and beyond, and these opportunities are presented by the curriculum transformation process that emphasises graduate attributes that commensurate with the needs and aspirations of the Fourth Industrial Revolution (4IR). With the prominence of soft skills in the 4IR, assessing the development and attainment of such skills would not be achievable using traditional assessment approaches such as summative assessment. Soft skills are "skills, abilities and traits that pertain to personality, attitude and behaviour rather than to formal or technical knowledge" (Moss and Tilly as cited in Teng, Ma, Pahlevansharif, & Turner, 2019: p. 591). Assessing immeasurable soft skills such as these requires innovative ways, and integrative assessment.

3.2.4. Integrative Assessment

The focus on learning and particularly lifelong learning in institutions of higher learning has raised questions about issues such as whether the predominant pedagogical approaches such as lectures and assessment practises like formative and summative assessment foster such learning. There are weaknesses within the traditional assessment methods that tend to promote learning for grades (assessment of learning) result in rote and surface learning. Formative assessment comes closest to having the ideal impact on learning, although it still has its shortcomings. For example, Wiliam (2011) posits that formative assessment may do a good job in helping educators to identify areas that need further elucidation or practice, but for students, it may only "tell them about their success or failure but not about how to make progress towards further learning" (Wiliam, 2011: p. 10). Therefore, integrative assessment which differs from traditional assessment types discussed so far, is critical.

Integrative assessment is the type whose purpose is to "provide feedback (or judgement) [to students] on their ability to be self-regulated learners, to identify and use standards and to apply their capabilities to future learning situations by being able to articulate their strategies or approaches to responding to a task or situation" (Crisp, 2012: p. 41). This means that integrative assessment promotes lifelong learning by playing a formative role whereby the feedback provided requires students to engage in "actions that improve learning [such as] undertaking the remedial activities provided by the teacher, asking a peer for specific help, or reflecting on different ways to move her own learning forward" (Wiliam, 2011: p. 12).

Integrative assessment has the potential to guide students to become self-directed learners and improve their metacognitive abilities. Of relevance is the metacognition that involves monitoring of cognition, which deals with "the awareness of the thinking and learning process [that] includes the awareness and willingness to reflect upon the learning process" (Akyol & Garrison, 2011: p. 184). As such, in the era where curriculum reforms focus on how to enable students to develop graduate attributes that meet the demands of the fourth industrial revolution, it would be wise for parallel assessment reform to consider integrative assessment (Table 1).

Table 1. Comparing types of assessment (Crisp, 2012; University of Namibia, 2014; Yorke, 2003).

Type of assessment	Features
Diagnostic Assessment	• Used at the beginning of a course or teaching activity • Seeks to identify gaps in student knowledge and identify deficiencies in their current understandings
Formative Assessment	• Takes place during the process of teaching and learning • Developmental in purpose through provision of feedback on performance to help students improve learning
Summative Assessment	• Administered at end of course of learning for progression and certification purposes • Indicates the extent of student success in meeting the assessment criteria based intended learning outcomes
Integrative Assessment	• Seeks to provide feedback to students on their ability to be self-regulated learners • Helps students to identify and use standards and to apply their capabilities to future learning situations

3.3. Digital Assessment to Improve Assessment Practice

The continued availability of technology and access to the Internet has encouraged higher education institutions to adopt eLearning to enhance teaching and learning activities. The use of technology has also been applied to assessment where assessment activities have been digitalised and moved online. This trend has particularly intensified during the COVID-19 pandemic when most teaching, learning and assessment activities moved online.

E-learning was rolled out to the rest of the University to help the digitalisation of learning, teaching, and assessment activities. The take up of e-learning grew exponentially during the COVID-19 pandemic. Guidelines were developed to support the use of digital assessment during COVID-19 pandemic. The aim for these guidelines was to fulfil one of the goals of the University of Namibia Assessment Policy, which proposes the establishment of "regulations, guidelines and procedures for integrated, coherent, constructive assessment strategies that effectively support the achievement of intended learning outcomes" (University of Namibia, 2014: p. 9). Lecturers were oriented to and informed on the variety of digital assessment tools and how they can be deployed to meet assessment needs.

3.3.1. Digital Assessment Model

Through reflectivity, the existing digital assessment practices at the University of Namibia were analysed and found to be lacking structural implementation of new initiatives which were also rather top-bottom in approach with little input from academics. From a criticality standpoint, this approach, if persisted with could result in resistance to innovation from end users (lecturers and students), thereby defeating the goal. While from a praxis perspective, the lack of lecturer

involvement and input may starve the digital assessment initiatives much needed theoretical bases and field experience to enable them to respond to and strengthen their relevance to the pedagogical needs on the ground.

In consideration of Stierer's (2008) triad of criticality, reflectivity and praxis discussed above, a digital assessment implementation model was developed to enhance the process of digital assessment adoption at University of Namibia. The model illustrated in Figure 1 follows a clear four steps process. Firstly, educators are expected to reflect on their existing practices by examining their pedagogical foundations as well as policies and regulations that guide them. This step helps educators to establish whether their practices are based in mere tradition and habit or are rooted in theoretical foundations and have a policy base. Examples of regulatory bases can be accreditation or professional bodies that may have an influence on the assessment practices in specific programmes.

It starts with the first step where lecturers reflect on current assessment practices and identifying the pedagogical or regulatory foundations such as accreditation or professional bodies that have bearing on the assessment practices. The second step is that of promoting the awareness of the affordances of technology for digital assessment, which is achieved through training and orientation. The goal is to improve educators' degree of comfort with technology and to develop an understanding of tools that they can use to implement digital assessment. Thirdly, the focus turns to developing educators' technological pedagogical understanding for them to move beyond simply translating existing assessment practices online towards identifying new opportunities offered by technology that were neither available nor considered when the academic programmes or courses were developed. The idea is to lead educators towards reforming their assessment practices to not only take full advantage of technology, but also to enable them to explore ways to achieve goals that were previously inconceivable, such as cultivating graduate employability attributes through assessment. This is
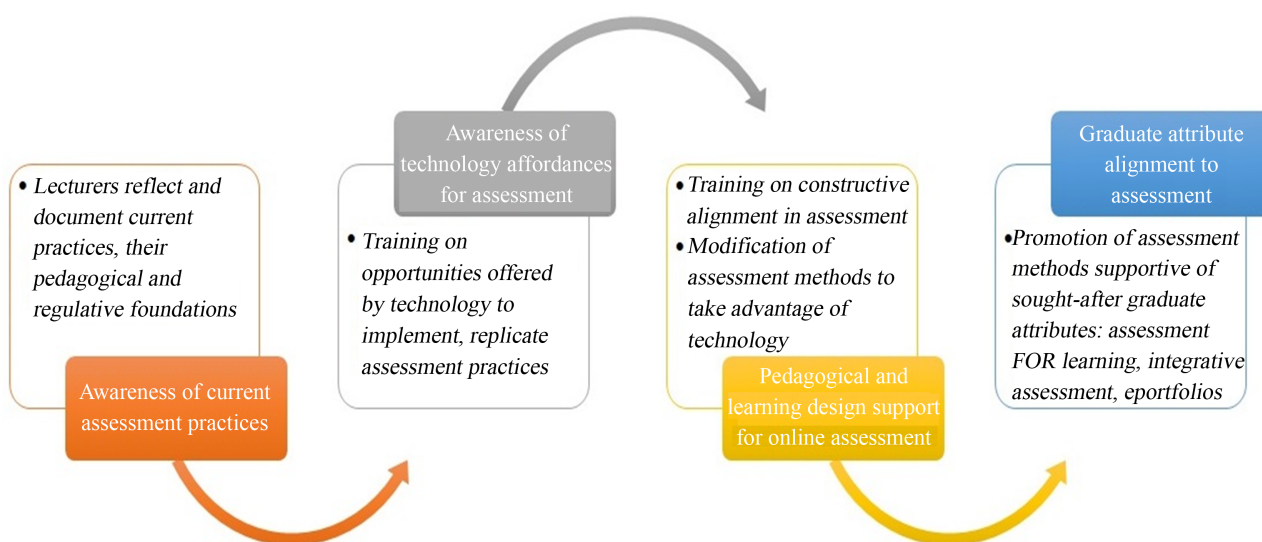

Figure 1. Proposed digital assessment model at the University of Namibia.

the fourth and final step, which is integrating graduate attributes in assessment planning and practices so as to implement integrative assessment, at which point assessment for learning is achieved, all made easier through the use of suitable technologies.

It is important to emphasise that the goal of the proposed model is not to simply promote the use of technology in assessment for its own sake, but more to strengthen educators' awareness of Constructive Alignment and implement it in the assessment process, while promoting the integration of graduate attributes and other soft skills in assessment planning.

3.3.2. ePortfolio and Integrative Assessment

The discussion above focused on the process of implementing digital assessment practices that are informed by criticality, reflectivity, and praxis. Now we address the question of how specific technologies can support specific assessment methods and goals. We have already mentioned that digital assessment provides an opportunity for integrative assessment by making the provision of timely feedback easier. One of the opportunities to implement integrative assessment at the University of Namibia is through the use of eportfolio assessment. An eportfolio is a tool that has been integrated into the Moodle learning management system using software called Mahara. It provides students with opportunities to practice their metacognition, by writing reflective journals, creating communities of inquiry where they discuss issues as part of the constructive learning approach and meaning making process. The eportfolio also gives students a platform to collect artefacts that document their learning process, and record evidence to demonstrate how they are meeting specific learning competencies, skills and experiences that they develop over the course of their academic studies (see **Figure 2**).

	○ ✕ ◑ ✓	First-year maths	Mentor meetings	Tutoring
Standards				⌃
Te Tiriti o Waitangi partnership	0 - 1 - 0 - 0	–	✕	–
Professional learning	0 - 1 - 0 - 0	–	–	✕
Professional relationships	1 - 0 - 1 - 1	○	✓	◑
Learner-focused culture	0 - 0 - 1 - 1	◑	✓	–
Design for learning	0 - 0 - 0 - 0	–	–	–
Teaching	1 - 0 - 0 - 0	–	–	○

Figure 2. Smart evidence matrix on Mahara eportfolio (Source: Mahara.org).

In fact, the eportfolio provides students with a personal learning space that they control, thereby enhancing their self-directed and lifelong learning, and graduate attributes discussed earlier in the 4th Industrial Revolution era. Such attributes can be infused within Mahara where standards against which students reflect and collect evidence of their learning, especially given that these are attributes that cannot be assessed or demonstrated through traditional assessment approaches. Furthermore, these guidelines when applied together with the Competency Frameworks in Moodle would provide a powerful set of tools that educators and institutions of higher learning can use to implement constructively aligned assessment strategies that make effective use of appropriate digital tools to achieve institutional teaching and learning goals.

4. Conclusion

To conclude, this paper discussed the issues and challenges associated with assessment in higher education. One of these challenges is the dominant role that traditional assessment methods such as summative and formative assessment play in determining what students focus on when they learn, how much effort they put into specific learning activities in relation to how they are assessed, or if they are assessed at all. It further discussed the different types of assessment and how they are practiced in higher education. It also compared the practice of assessment in how it is used as well as how it is generally applied on the ground on one hand, and how it is defined and postulated in policy documents. The paper demonstrated fulfilling some of the Assessment Policy goals as well as the ideas learned from literature, through creating guidelines that help academics to implement digital assessment and to achieve integrative assessment. This has helped to fill theoretical and praxis gaps and opportunities for the role of technology in supporting assessment policy implementation. Technology is a tool for opening opportunities for accommodating new ways of curriculum implementation such as the mirroring of graduate attributes into the competency frameworks on the digital learning platform to be able to track student achievement thereof through assessment tasks. Finally, there are opportunities for further collaboration among different institutional departments such as the faculties, quality assurance, innovation in learning and teaching, and research units, towards investigating, improving, and implementing new ways of assessing that are forward-looking and more supportive of student learning beyond their university careers.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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