Rethinking Rwandan higher education assessment system and approaches

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Abstract

In recent years, there have been increasing critiques leveled against Rwandan higher education for the quality of its graduates and various attempts have been made to address the problem. It is argued here that the role played by assessment in Rwandan higher education system has not been given sufficient attention in previous critiques. Research suggests that assessment plays a major role in what and how students learn. Assessments explicitly designed to promote learning lead to complex learning achievements that are widely deemed critical in the 21st century. However, there are indications that Rwandan higher education assessment system has been dominated by summative assessment which does not necessarily promote learning, and is sometimes counterproductive. This paper argues for a more strategic perspective on assessment in a balanced fashion with the main purpose of promoting more complex learning among students. A new assessment paradigm is proposed whereby students should play a central role in ongoing monitoring of their learning.

***Key words**: Assessment purposes, summative assessment, formative assessment, learning complexity, self-regulated learning*

Introduction

Assessment is viewed as "the process of gathering and evaluating information on what students know, understand, and can do in order to make an informed decision about next steps in the educational process" (Clarke, 2012, p. 1). This information can be generated through a variety of processes, tools and practices ranging from informal conversation between the student and the teacher through the use of formal tests. The nature of the decisions based on assessment outcomes range from those about the next step in learning a lesson, to decisions about promotion or certification, or even decisions about the quality of a system of education, as is seen in the use of moderation and external examinations. In all of these cases the assessment can be seen to be of a high-stake nature. But the decisions made in the first case, about the next steps in students' learning, can be seen to exert influence on assessment outcomes in each of the other cases. It is therefore important for educators to think about the purposes their assessment practices serve, and to understand the intended and unintended effects assessments can have on students' learning.

This paper was guided by the following three questions about Rwandan higher education: What types of learning are Higher Education assessment practices promoting? What role are University students playing in the assessment process? How could assessment be used to stand Rwandan students in good stead for the currently changing world? These questions are relevant to a variety of assessment purposes crucial in the design and practice of effective assessment systems (Earl & Katz, 2006). The paper argues for a shift in the way that assessment is understood and used in Rwandan higher education and proposes an assessment paradigm that potentially promotes high-quality learning in the first place.

How assessment influences student learning

The educational purposes of assessment are not limited to the gathering of information about what students have learned in a unit of work, even though such use of assessment may be the dominant association generated by higher education teachers in discussion of assessment. Such a response is understandable given that each lecturer must provide assessment information about the achievement of each student, typically to a formally constituted assessment body. In this work lecturers may spend a lot of time in making decisions about how many marks to allocate to a student response and what grade to assign to a specific performance. Such important decisions are necessarily a major part of teaching. However, these decisions about what is the current state of learning, which could be seen as retrospective in nature given that they look back over what the student has done, represent only one aspect of assessment. All higher education assessments also have a prospective function of shaping and driving student learning.

Assessment shapes students' learning because it gives the most obvious indication of what type of learning is valued in any education system (Boud, 2007; Boud&Falchikov, 2007; Gibbs, 2006a). Indeed, students can become so strategic that "they allocate their time and focus their attention on what they believe will be assessed and what they believe will gain good grades" (Gibbs, 2006a, p. 23). This shaping occurs when a lecturer provides a course outline, or states a set of learning outcomes or objectives, or provides formative feedback, or provides summative feedback, or provides past examination papers or trial examination questions. In each of these cases the student can generate information about what is valued by the lecturer and what must be done in the future to achieve the standards associated with the unit of work or the course.

We should expect students to be strategic in generating and using the information gathered from these teaching materials. Such activity seems appropriate in the sense that the students are working to achieve the goals set by the lecturer. It seems reasonable to suggest that this response applies to all students who are working to achieve a satisfactory level of performance in the course, though many may aim to display more than just a passing standard of achievement. The issue of concern in considering the shaping role of assessment is not therefore with the strategic responses of students but with the standards of achievement and learning outcomes represented in the assessment material made available by the lecturer to the students. Indeed, as Gibbs (2006a) warned…student learning can be poor largely because the assessment system does not work well, and … changes solely to the assessment, leaving the teaching unchanged, can bring marked improvements" (p. 35). Gibbs's observation calls for an explicit consideration of all purposes of assessment in any system of education.

Assessment purposes

There is no one agreed set of terminologies to depict the types and purposes for assessment. The most common terms used to distinguish between types of assessment are formative and summative assessments, the former being less concerned with making of high stakes judgments. Some researchers (Bloxham& Boyd, 2007) propose four purposes namely certification, quality assurance, student learning and lifelong learning capacity. Some reduce this to

three including assessment *of* learning, assessment *for* learning and assessment *as* learning (Earls, 2003). Others (Sadler, 1989; Shepard, 2005) do not make distinctions between assessments *for* learning and assessment *as* learning as they seem to be part of formative assessment as a broader category. Others agree that the limit between summative and formative assessments is unclear and that it all depends on the function the assessment is posed to serve.

For the current purposes in this paper I see it as important to distinguish among three purposes identified by Earl (2003) as shown in table 1. If these are appropriately balanced I suggest that the retrospective summative assessments and others designed for judging the quality of the higher education system have the potential to be more positive.

Table 1: Features of assessment *of*, *for*, and *as* learning

Approach	Purpose	Reference Points	Key Assessor
Assessment *of* Learning	Judgments about Placement; Promotion; Credentials, etc. Quality assurance	Other students Standards	External examiner Teacher
Assessment *for* Learning	Information for students' future learning and teachers' instructional decisions	External standards or expectations	Teacher, student
Assessment *as* Learning	Self-monitoring and self-correction or adjustment	Personal goals and external standards	Student

Source: Adapted from Earl, 2003 and Bloxham&Boyd, 2007.

Summative assessment of learning

Summative assessment mainly reflects the traditional paradigm of assessing educational outcomes (Shute & Becker, 2010). Also referred to as assessment *of* learning, summative assessment helps summarise learners' achievements at a particular time (Harlen, 2006). It is usually administered, 'after some major events, like the end of the school year or marking period; or before a big event, like college entry (Shute & Becker, 2010, p. 8). Harlen and James (1997) described summative assessment's main purpose as describing the overall learning progress at a certain point in time so as to report to a range of educational stakeholders including parents, teachers, schools or others. Instances of summative assessment include assessment for grading, promoting, and certification.

Summative assessment is needed but if it is the only type of assessment used, or even the one given dominant attention, it will act to limit the effectiveness of the overall system of assessment. It is used to generate reliable data that can be used to compare student performances across diverse populations on selected learning standards and by informing educational policy (Shute & Becker, 2010). However, research has documented the backwash, mostly unintended, effects of strong reliance on summative assessment on a part of the student population,

especially the low achievers (Stiggins, 2009; Black & William, 1998). For Stiggins (2009), repeated evidence of poor performance, without other support, can cause long-term loss of confidence in students. This would get even worse in the case of continuous assessment tests whereby, the evidence of poor performance not only harms poor performers' self-esteem and self-efficacy but also widens the gap between their performance and that of higher-achieving students (Harlen& Deakin, 2002). Such effects act to weaken student learning. Likewise, summative assessments, mostly used for accountability purposes, are unable to inform student's progress toward the achievement of intended objectives since it focuses only on the student's learning product (Earl, 2003). In order to address such weaknesses, countries have turned to formative assessment as a crucial additional component of a balanced assessment system (Darling-Hammond &Pecheone, 2009).

Formative assessment for learning

Black et al. (2004) gave a detailed description of formative assessment for learning:

> *"Assessment for learning is any assessment for which the first priority in its design and practice is to serve the purpose of promoting students' learning. It thus differs from assessment designed primarily to serve the purposes of accountability, or of ranking, or of modifying student behaviour, or of certifying competence. An assessment activity can help learning if it provides information that teachers and their students can use as feedback in assessing themselves and one another and in modifying the teaching and learning activities in which they are engaged. Such assessment becomes "formative assessment" when the evidence is actually used to adapt the teaching work to meet learning needs"* (p. 10).

As the above definition indicates, feedback is an integral part of formative assessment as it informs the next step in learning. This feedback will be most useful when it informs the student about how to improve the level of current performance. It is in this sense that the assessment information can be seen to be formative, to help 'form' the student's subsequent learning,

However, strong reliance on the external feedback (e.g. from teachers, mentors or supervisors) might not be always helpful either (Nicol& Macfarlane-Dick, 2004). Defined in its narrow form, where the teacher is the main assessor, feedback is external. It consists of a teacher's provision of comments and judgments of the student performance with regard to the point of reference (standard or criteria defined by the learning outcomes) set in advance and the remedial advice as to how to achieve the intended learning outcomes. While, such external feedback can help bring about improvement in student' learning, the risk is that it could undermine the students' autonomous regulation of learning (Torrance, 2007) by maintaining their dependence on the teacher (Sadler, 1989). Far from promoting an orientation towards student autonomy and 'Learning How To Learn' …, such practices are interpreted as techniques to assure award achievement and probably help to produce students who are more dependent on their tutors and assessors rather than less dependent" (Torrance, 2007, p. 282). The complementary aspect of feedback, and probably the one given least explicit attention, is the one which is internally generated by the learner through self-assessment. This is assessment as learning through which students continuously monitor and regulate their learning by deciding the

next steps in their future learning. Table 2 illustrates these different feedbacks all of which are necessary in a balanced assessment system.

Assessment as learning and self-regulation

Assessment as learning promotes complex learning achievements. Earl's (2003) definition of effective assessment highlights the typical features of assessment *as* learning, describes how it works and its benefits to students learning. It mainly shows that self-assessment is at the core of an effective assessment culture:

> "*Effective assessment empowers students to ask reflective questions and consider a range of strategies for learning and acting. Over time, students move forward in their learning when they can use personal knowledge to construct meaning, have skills of self-monitoring to realize they don't understand something, and have ways of deciding what to do next … Students, as active, engaged, and critical assessors, can make sense of information, relate it to prior knowledge, and master the skills involved … Students are their own best assessors"* (p. 25).

We see in Earl's description that assessment as learning has the potential to influence key learning processes – analysis of new information, linking of that information with prior knowledge, evaluation of that knowledge which makes this self-assessment a knowledge construction activity. This is one of the ways in which the students act as their own teachers as suggested by constructivist learning theory which is widely considered the best method for teaching and learning (Bransford, Brown & Cocking, 2000; Bruning, Schraw&Norby, 2011; Mayer, 2008; Powell &Kalina, 2009).

Table 2: Assessment purposes, sources and forms of feedback

Assessment approach	**Formative assessment**		**Summative assessment**	
	Assessment *for* learning	Assessment *as* learning	Quality assurance	Certification
Assessment form & source of feedback	Teachers' and peer-assessment	Self & peer-assessment	External & Internal	Teachers' assessment
	⇩	⇩	⇩	⇩
Form of feedback	External feedback to improve learning and instruction	Internal feedback Lifelong learning	System's performance Quality of procedures	Marks Grades

In a balanced assessment system, assessment tasks for students should include all three types of tasks: summative assessment tasks, formative learning tasks and self-monitoring tasks (Keppel & Carless, 2006). Students' acquisition of the evaluative expertise is the prerequisite for learning achievement (Sadler, 1989). In stressing the importance of self-assessment in self-monitoring, Sadler (1989) suggested that:

> *"… the indispensable conditions for improvement are that the student comes to hold a concept of quality roughly similar to that held by the teacher, is able to monitor continuously the quality of what is being produced during the act of production itself, and has a repertoire of alternative moves or strategies from which to draw at any given point. In other words, students have to be able to judge the quality of what they are producing and be able to regulate what they are doing during the doing of it* ... (p. 121).

Research has related formative assessment to self-regulated learning (e.g. Nicol& Macfarlane-Dick, 2006; Black &Wiliam, 2009). During any learning students must regulate or manage their own learning processes (e.g. Bruning et al. 2011) and students with effective regulatory processes can regulate their self-improvement and have greater potential to become effective lifelong learners (Zimmermann, 2002). Relating formative assessment with self-regulated learning distinguishes formative assessment from other forms of educational assessment (Clark, 2012). According to Clark (2012),

> *"… formative assessment is designed to continuously support teaching and learning by emphasizing the meta-cognitive skills and learning contexts required for self-regulated learning; planning, monitoring and a critical yet non-judgmental reflection on learning, which both students and teachers use collaboratively to guide further learning and improve performance outcomes"* (p. 13).

Clark went on to suggest that, unlike a test or a tool, formative assessment is a process with the potential to support learning even after formal schooling, by developing learning strategies which are transferable to a variety of graduates' situations across their whole life-span. Clark's statements suggest that through formative assessment students can achieve higher learning levels and develop the lifelong learning habits that are crucial in a rapidly changing world that requires readiness to rapidly learn new skills and develop new knowledge. However, most researchers seem to agree that, in most institutions, the assessment approaches that promote higher order learning have been overshadowed by the dominance of summative assessment (measurement) of learning achievements (e.g. Boud and Associates, 2010; Carless, Joughin, & Mok, 2006; Gibbs and Simpson, 2004-5). As will be demonstrated in the next section, the Rwandan higher education assessment context has similar limitations from both policy and practice viewpoints.

The context of assessment in Rwandan higher education

The national vision and mission of higher education

The government of Rwanda has stressed the need to have higher education graduates equipped with the critical skills necessary to realise its dream to establish a knowledge-based economy. Capabilities such as lifelong learning and critical thinking are recurrent in all Rwanda's key strategic orientation official documents such as the second Economic Development and Poverty Reduction Strategy (EDPRS2) (Ministry of Finance and Economic Planning, MINECOFIN, 2013), the Education Sector Strategic Plan (Ministry of Education, MINEDUC, 2010), and the Higher Education Council's (HEC) National Learning, Teaching and Assessment Strategy (HEC, 2007a). For example, one of the expected outcomes of EDPRS2 is to have graduates who are prepared for the job market with the required critical skills

referred to as "catalytic skills" (MINEDUC, 2010). Stressing the need to ensure graduate's self-assessment and self-regulative skills, HEC (2007a) recommend that "all students will also be provided with opportunities to engage in personal development planning, to ensure that they are aware of their own strengths and able to recognize the areas in which they can improve further" (p. 4). Likewise, EDPRS2 recognises the importance of the development and assessment of essential (cognitive and non-cognitive) higher order–skills required for the productivity and employability of the youth and for the country's economic development in the following terms:

> "*There is strong evidence of a causal relationship between skills and growth in incomes. This evidence reveals that it is not just the years of education that contribute to economic growth, but the quality of education that is received and the skills that people acquire…It is also critical that we measure learning outcomes and not just school enrolment (though this is also important*)" (MINECOFIN, 2013, pp. 57-58).

The mission assigned to higher education in Rwanda reflects more ambitious and complex learning achievements expected from students. This desire to achieve higher learning levels creates new challenges for education stakeholders, mainly teachers and students, to reconsider their respective activities in and outside classrooms, including their use of assessment.

Assessment policy framework

HEC (2007a), through its National Learning, Teaching and Assessment Policy (HEC, 2007a), places assessment at the heart of student learning quality when it encourages the use of formative assessment and summative assessment. The policy stipulates that "assessment is an integral part of learning and teaching activities. The purposes of assessment are to help staff and students monitor and improve learning, to provide a measure of student achievement and to help assure academic quality and standards" (p. 6). Likewise, the Academic Quality Assurance and Enhancement and the Maintenance of Standards in Higher Education Handbook (HEC, 2007b) provides a description of the direction of assessment and the conditions under which it should be undertaken. Some of the outlined procedures are such that assessment should be appropriate for their purpose, whether diagnostic, formative or summative, and have clear published criteria for marking.

However, a further analysis of HEC's vision of assessment reveals a strong inclination toward mostly summative assessment purposes of quality assurance and certification with little reference to the typical practices of formative assessment for learning. For example, HEC (2007b) defines assessment as an "academic work done by students and marked by academic staff–both formative and summative" (p. 10). The assessment strategy statement (HEC, 2007a) also disregards the internal feedback generated through self-and-peer assessment in its description of formative assessment: "Formative assessment is designed to help learners learn more effectively through giving them feedback on their performance indicating how it can be improved" (p. 6). It is also stipulated in HEC (2007b) that... assessment should be appropriate for measuring learning outcomes... Assessment should be carried out professionally

at all times and takes into account the extensive knowledge which exists about testing and examination processes (p. 79).

The same trend is also typical of the current higher education regulations (HEC, 2013). The regulations highlight the procedures of examination and grading while insisting on the equity, transparency, validity, and reliability principles of assessment for certification and quality assurance. The regulations have no explicit consideration of the important aspects of formative assessment such as self-assessment and the use of assessment to promote higher-order learning and teaching.

It turns out that these policy documents present assessments as tools for measuring learning achievements and for quality assurance. They emphasize what should be done by external assessors, leaving aside what students could do in the assessment process. In fact, they do not explicitly consider developing students' self-evaluative skills, known for their potential to produce more complex, higher level and good quality learning.

Modularization

Over the last decade, Rwandan higher education has undergone a number of changes that have had particular effects on how teaching and assessment, and eventually learning, are practiced. These changes include the modularization of instruction and the growth in class size. Arguably, the modularization, which has been in place since 2008 (Mugisha, 2010), has had the major and most direct influence on teaching and assessment, and ultimately on the learning process and outcomes. The introduction of the modular system aimed at increased involvement of students in the learning process according to the Rwanda Higher Education Council: "We have been using the teacher-centered type of teaching where the lecturer provides the student with everything hence giving the students no chance to do their own research. But this new system will allow participatory learning for the students" (The Executive Secretary of the Rwanda Higher Education Council cited in Kwizera, 2010).

Most modules are 10 credits, spread over 12 teaching weeks, at undergraduate level and each module is assessed in a summative way as a separate unit. Consequently, the volume of summative assessments has increased across the 12 weeks and the 2 weeks of final examinations. Under the higher education academic regulations (HEC, 2013), a full-time undergraduate student must take 120 credits in an academic year, meaning six 10-credit modules on average per semester. On top of one final examination, students have to take at least one supervised Continuous Assessment Test (CAT) for each module. Table 3 shows the average number of summative assessments taken by undergraduate students in different program levels during the courses. Overall, a Rwandan undergraduate student faces a minimum of 48 and 96 summative assessments at diploma and bachelor's degree levels respectively. This means on average one summative assessment every week of the course.

Table3: Average minimum of summative assessments per level

		Type of summative assessment		Total
Level	Duration	End of semester examination	Supervised CAT	
Diploma	2 years	24	24	48
Bachelor's degree	4 years	48	48	96

Source: adapted from HEC, 2013.

For the lecturers the amount of summative assessment to be carried out for each class is therefore considerable, and this load would become more significant if a lecturer had more than one module. The summative assessment load might well preclude the allocation of attention during teaching to formative assessment and the scaffolding of students' self-assessment.

Large classes

Over the last two decades, Rwandan education system has been characterized by increasing number of students at all levels. The implementation of Education For All initiative has resulted in bigger numbers of secondary school graduates which also resulted in increased higher education enrolment rates. This has in turn led to large classes in higher education especially for general or cross-cutting modules. For example, all students (say 1000) admitted in a teacher training institution must take all education modules in one class whereby lecturing is the main teaching method. With such a size, tutorials are usually used as supplement to lectures (Gibbs, 2006b) but in my experience as a higher education tutor, tutorials are rare, or inexistent, in many Rwandan higher education programs. This means an exponential increase of the assessment volume for teachers and students within a limited time for each of the 15 weeks of a semester. Students have limited time to prepare for and complete their assignments and other summative assessments while teachers have limited time to provide formative feedback to students. Formative assessment practices, and focused attention on self-assessment are less likely to take root in such circumstances (Gibbs, 2006b).

Research evidence on higher education assessment in Rwanda

A few existing empirical studies on assessment in higher education institutions in Rwanda indicate a pervasive use of assessment *of* learning over assessment *for* learning and student self-assessment (Mugisha, 2010; Nyiratunga, 2007; Rwanamiza, 2004), a situation which does not promote complex learning achievements as discussed earlier in this paper. A case study by Rwanamiza (2004) revealed that formative assessment had been poorly practiced in higher education and that students turned to rote learning to obtain higher marks and partly due to rote teaching, these findings were echoed in a later study by Nyiratunga (2007). Likewise, Mugisha (2010) reported that the prevalence of summative assessment *for grading* in Rwandan higher education institutions limited student chances of developing

higher order thinking skills and led to surface learning. This is exemplified in student technique of "studying the teacher" (Mugisha, 2010) which simply means that students learn to ensure that they pass the course/subject/module instead of mastering the learning outcomes. Also, a recent study by Mbabazi, Dahlgren and Fejes (2012) reported that Rwandan students' ill-preparedness for the learning demands of higher education as one of the major barriers to quality learning.

In related research Nyiratunga (2007) compared assessment practices in writing modules at the University of Witwatersrand (Wits) in South Africa and the National University of Rwanda (NUR). This comparison revealed some concerns about the key characteristics of assessment *for*/*as* learning such as feedback and self-assessment. In the Rwandan context students were reluctant to consult with lecturers to seek assistance, and the little consultation that did occur was often concerned with a challenge about the awarded mark. The findings in this paper also reported students' complaints over the lack of feedback by lecturers on their papers and simplistic nature of feedback, with more emphasis on surface language errors and less on content and organisation. Nyiratunga also revealed the lack of students' active reflection on their learning as part of the assessment of the module at NUR, unlike the situation at Wits. These practices seem highly likely to compromise the promotion of the complex level of learning expected of Rwandan graduates. In a study by Mbabazi et al. (2012), higher education teachers reported that Rwandan students displayed too much dependence on the teacher, which they saw as one of the five major barriers to quality learning. Note that this Rwandan students' characteristic, and the other four barriers (poor preparedness for higher education, poor reading culture, unfamiliarity with deep learning approach) are inconsistent with the main feature of the expected self-regulated learning and lifelong learning habits.

The case for a paradigm shift

The mission assigned to Rwandan higher education requires a 'paradigm shift' in the way we conceive of education assessment. Assessment from most higher education students', teachers', and policy makers' perspective has been geared to grading, certification, and quality assurance. The current dominant paradigm is largely summative so that student learning, and to some extent teaching, is grade-driven. In terms of the process that leads to learning, as distinct from the product of learning (marks, grades), the system described above seems to be process-blind (Knight, 2002). The learning process that leads to the learning product is given little attention and consequently, students tend to play a passive role in the assessment and monitoring of their learning achievements. The suggested approach to assessment would look at assessment through the lens of learning complexity so that the system of assessment could make a stronger contribution to the achievement of complex learning that is typical of the learning outcomes expected. The assessment system needs to be more balanced so that it drives each of the three valuable types of assessment and does more than focus on just grading and quality assurance.

The critical skills expected from students and graduates are such that neither numerical feedback on final examinations nor supervised CATs can suffice to develop higher order learning. Summative assessment does not necessarily promote high quality learning. Summative assessments are not designed to provide students with detailed

feedback about how performance can be improved. The provision of such feedback is more the function of formative assessment. A summative assessment-dominated system is therefore inappropriate if students are to develop more effective learning skills such as metacognitive skills and lifelong learning habits. In the context of a higher education system characterized by large classes and frequent summative assessments associated with modularization, it would also seem necessary to involve the students in the assessment processes more directly. If students in the current higher education system are educated in processes of self-assessment for themselves and their peers they will be able to increase the amount of feedback available in the system**.** Because higher education students typically spend a large proportion of their time in direction of their own learning in large classes and in private study, the move to increase their assessment skills can be seen to have major potential to have benefit for their learning. Indeed, as Sadler (1989) pointed out, student active role in the assessment process, in self-and peer-assessment is a pre-condition to learning achievements. The promotion of these complex learning processes requires a different conception of assessment, one that makes provision for the other forms of assessment. The main argument of this paper is not to suppress summative assessment but to supplement it with alternative assessments that make explicit provision for the fostering of higher quality learning.

The new paradigm

A balanced assessment system

The proposed paradigm is the one in which assessment is designed and practiced in strong consideration of all three major assessment purposes. It is a balanced system whereby assessment is used for the ultimate goal of education, that is, to promote high quality learning of students. This is only possible when all assessment purposes are explicitly acknowledged and an enabling environment is in place with appropriate tools made available for use by teachers and students.

Explicit consideration of assessment purposes

Assessment practices send to students the signals of what teachers would like to be learnt, how that learning could take place, and therefore promotes particular types of learning. In so doing, these practices shape the kind of product we have in the end (ultimately the type of citizen who is a lifelong learner). The situation of Rwandan higher education described above does not seem to be sending the right signals to students. As Knight (2002) insisted,

> *"There is a need for systems of formative assessment that engage students with feedback about their work in order to signal what else is valued in the curriculum, what might count as fair evidence of achievement in those terms, and to indicate directions for further learning"* (p. 284).

Undoubtedly, the ultimate goal of higher education is to promote high quality learning and not simply to produce marks and grades. All we need in the end is a balanced assessment system whereby the summative and formative functions of assessment are all given their rightful values. In the new paradigm, summative assessment of learning would obviously continue to have its place (to serve certification and quality assurance purposes mainly) but it must be

used in a more effective way in order that the benefits associated with a more balanced system of assessment are to be realized. Indeed, formative assessment and self-assessment must be given their rightful priority if higher education graduates are to be more effective regulators of their own learning, more responsible lifelong learners and citizens. Our assessment beliefs, designs and practices must be reflective of this reality. Hence, assessment for learning and assessment as learning practices should also be major priorities in the new assessment culture.

Assessment with and by the learner

The new paradigm focuses on making explicit provision for formative feedback and student feedback with emphasis on the learning process rather than just on the product. The provision of formative feedback would entail teachers giving ongoing comments that are constructive, positive and improvement-oriented, in what can be seen as assessment with the learner. This entails a consistent and ongoing dialogue with the student (Shepard, 2005). This should however be arranged so that there is not a danger of students developing a dependence on the teachers (Torrance, 2007). As Knight (2002) put it, "the aim of formative assessment would be to stimulate discourse characterized by listening and exchange, with as little imbalance of power as possible" (p. 284).

The complementary component of this new paradigm should consist of student-generated feedback on the learning process - assessment by the learner or self-assessment. In other words there should be a considerable level of the decentralization of the assessment authority from the administration and the teacher down to the student. This would include the generation by the student of an evaluation of the strengths and weaknesses in their current understanding or performance. These evaluations could then be available to the student, to fellow students and to teachers, thereby increasing the potential for informative feedback being provided from these multiple sources.

Students' involvement in self-assessment and peer-assessment must be made more explicit. Self-assessment is at the heart of effective assessment and research findings are promising as to its potential to promote learning. When used appropriately, self-assessment leads to students improved self-efficacy and confidence to learn and consequently to improved performance on summative assessment exercises (McMillan & Hearn, 2008). For example, research by Orsmond, Merry and Reiling (1997) revealed that self-assessment is an essential formative educational tool which can be used to improve students control over their learning processes. So, teachers should scaffold the evaluative skills (Sadler, 1989, Shepard, 2005) so that learners eventually become able to more accurately judge the quality of their performance/learning without the assistance of the teacher, a condition for learning improvement (Sadler, 1989). This means that our instructional activities within each instructional module must make time to explicitly promote such self-evaluative skills as Riordan and Loacker (2009) put it:

> *"The most effective teaching eventually makes the teacher unnecessary... students will succeed to the extent that they become independent lifelong learners who have learned from us but no longer depend on us to learn[…]A key element in helping students develop as independent learners is to actively engage them in self-assessment throughout their studies"* (p. 181).

An enabling assessment environment

Establishing effective teaching as described by Riordan and Loacker (2009) requires an important change in the assessment environment to ensure that the delivery of every module integrates assessment tasks that require students to reflect on and monitor their learning progress without being distracted by the marks. This in turn requires the provision and use of relevant student self-reflective learning and assessment tools that have proven to foster lifelong and self-regulated learning such as learning protocols, reflective journals (e.g. see Keppel and Carless, 2006), and portfolios including electronic portfolios (e.g. see Barrett, 2005). Of great importance too is the need to make assessment tasks as much authentic as possible meaning that where possible, unlike formal examinations and tasks, they should examine students' performance on the valued learning outcomes (Wiggins, 1990). For example, if one of the learning outcomes of a pre-service teacher is to create and improve required teaching resources in a given teaching subject, it would be irrelevant to require this student-teacher to write an essay on improvisation, instead, the student needs to be given a chance to create those resources and use them in the real classroom settings. In the same way, it is more helpful to require computer students to type a text of their choice and format it in the required way than asking them to submit a hand-written work describing how formatting is done.

For an effective assessment environment, an appropriate regulation system must be put in place. At all levels, from departments and faculties within institutions and up to national level, assessment policies should be designed to explicitly describe each level's approach to the expanded approach to educational assessment. Such policies should be reflective of the principles that include explicit provision and time for formative assessment. Most importantly, at the centre of assessment policies should be a strong emphasis on promoting student learning. The policies should also describe the procedures of collecting and recording a range of evidences of students' learning progress and achievements as well as their use by different stakeholders. A change in policy of this nature also has strong implications for the arrangement of teaching, including for modularisation, module content, timetabling, and the design of assessment tasks.

Conclusion

The main mission of higher education is to promote higher order learning and lifelong learning habits for all students and assessment has proven to play a critical role to accomplish this mission. This paper has argued for the need to use assessment more strategically to promote complex learning achievements for Rwandan higher education students and graduates. Maximizing the potential of assessment to promote complex learning requires Rwandan higher education administrators, teachers, and students to rethink assessment through the lenses of its primary mission. Assessment policy and practices should be reconfigured in the framework of a balanced assessment system that caters for all three main assessment purposes (assessment for learning, assessment as learning and summative assessment). In the proposed paradigm, particular attention should be put on assessment practices and tools that help students regulate their learning process. Therefore, the current mindset which is dominated by summative assessment of learning must

change and a substantial amount of energy and other resources should be transferred to the explicit provision of opportunities for formative assessment for learning. After all, modern theories (cognitive and constructivist) of learning (e.g. Bruning et al., 2011; Mayer, 2008; Pritchard&Woollard, 2010; Shepard, 2005; Powell&Kalina, 2009) suggest that effective learning is not something done on or for the student; instead it is done by and with the student and so should be assessment.

The practices advocated in this article might not be brand new in Rwandan higher education though. They might have been used to some extent in different institutions or even by individual lecturers. My wish is that they are systematically understood, adopted and embraced by various stakeholders of higher education in Rwanda. Faculties and departments could revisit their assessment policies and strategies to ensure that there is a stronger emphasis on those practices that foster students' ongoing assessment for the monitoring and regulation of their learning. Such strategies should be explicitly taught to students and practiced by all lecturers in their daily teaching and assessment practices.

Deepening teachers' and students' skills and knowledge about assessments that promote learning is critical. The in-service training or professional development of faculties' and departments' members should address this issue. Professional learning teams could be established to try out formative assessment ideas within specific subjects in form of action research projects. Further research should also consider developing and evaluating assessment tools that would provide evidence of students' acquisition of science informed competencies for different areas of specialisation.

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