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Formative and Summative Assessment in Educational Enterprise

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Abstract
There exist relatively little emphasis on assessment in the preparation and professional development of teachers. In light of this and current demands for comprehensive evaluation amidst contemporary theories of learning and motivation, this article attempts to establish the rationale for the use of formative and summative assessment in educational enterprise. The paper delved into the concept and typology of assessment, validity, reliability and manageability of assessment, purposes and uses of assessment and the relationship between formative and summative assessment. The paper concludes that both formative and summative assessments are necessary tools in every educational system because through them administrative decisions such as ability streaming, selection and certification are taken.
Keywords: formative assessment, summative assessment, appraisal, evaluation

Introduction

The term "assessment" is used to refer to the process of investigating the status or standard of a learner's achievement/attainment or the achievement of a group of learners, where group instruction prevails, with reference to expected outcomes which must have been specified as objectives (Anikweze, 2013). It covers classroom-based assessment as well as large-scale, external tests and examinations. The term "appraisal" is used to refer to judgements on the performance of school-level professionals, e.g. teachers and principals. The term "evaluation" is used to refer to judgements on the effectiveness of schools, school systems and policies.

Assessment and evaluation both describe a process of generating and interpreting evidence for some purposes. They both involve decisions about what evidence to use, the generation and collection of that evidence in a systematic and planned way, the interpretation of the evidence to produce a judgement, and the communication and use of the judgement (Crosssouard, 2012). It is worth noting that the evidence, of whatever kind, is only ever an indication or sample of a wider range that could be used. For the purpose of this paper, the word 'assessment' is used to refer to the process of collecting and using evidence about the outcomes of learning, usually students' learning, but it can also refer to the learning of others such as teachers. 'Evaluation' is used in relation to generating and using evidence about systems, materials, procedures and processes. Evaluation of schools, systems and teaching approaches may make use of evidence of students' learning, but the judgement is about the value or success of other things such as school policies and programmes rather than the learning of students, although this may be part of the evidence used in the evaluation.

Although the terms assessment and testing are sometimes used interchangeably there is an important distinction between them. Testing may be regarded as a method of collecting data for assessment, thus assessment is a broader term, covering other methods of gathering and interpreting data as well as testing (Dolin & Krogh, 2010). A closer look at what assessment involves helps to clarify this relationship and to identify other aspects of assessment involving words such as 'standards' and 'criteria'. According to Ertl (2006) all assessment of students' achievements involves the generation, interpretation, communication and use of data for some purpose. In just this simple statement there is room for an enormous range of different kinds of activity, but each will involve a) students being engaged in some activity, b) the collection of data from that activity by some agent, c) the judgement of the data by comparing them with some standard and d) some means of describing and communicating the judgement. There are several forms that each of the components of assessment can take.

a) Activities in which students are engaged can be, for example: their regular work, some written or practical tasks created by the teacher for the purpose of assessment and some written or practical tasks created externally.

b) The data can be collected by: the teacher, the students, the teacher and students together and an external agent (examination board, qualifications authority, test developer).

c) The data can be judged in relation to: norms, in which the standard of comparison is the performance of other students (norm-referenced), criteria, in which the standard of comparison is a description of aspects of performance (criterion referenced) and students' previous performance, in which an individual's performance is judged in relation to the student's other or earlier performance (student-referenced or ipsative).

d) The judgements can be communicated as: a written or oral comment by the teacher, a mark or score or percentage, a profile of achievement, a level or grade and a ranking or percentile.

Different assessment tools and procedures are created by different combinations of these various ways of collecting, judging and communicating data. For example, a standardized test comprises tasks created by an

external agency which will have trialed the test during development with a large sample of the appropriate population, so that an individual's score can be expressed in terms of comparison with the 'norm' for that population. The result will indicate whether a student's performance is above or below average but not what he or she can do (Hattie & Timperley, 2007). A criterion-referenced test differs from a norm-referenced test by being designed to give information about what a student can do in relation to specified outcomes. The items will be chosen for their relevance to the curriculum so that the results can be used in establishing, not how a student compares with others, but how his or her performance compares with the intended performance (Linn, 2000).
At the same time, the target level of performance is set by reference to what can be expected of the population for whom the test is intended. Thus there is a normative element in deciding the criteria against which performance is judged. When tests are used the data are restricted to the items in the test, whereas if the assessment is carried out by teachers there is the potential to use the full range of learning activities in making judgements using criteria of expected performance in relation to lesson goals.

Validity, Reliability and Manageability of Assessment
To decide the best way of conducting assessment in a particular case it is necessary to consider the properties of possible tools in relation to the purposes and uses intended for the assessment results. One obvious desirable property is that any assessment should be valid for its purpose; that it assesses what it is intended to assess. Another is that it should provide reliable, or trustworthy, data. But there are also other matters to be taken into account; in particular, in view of the interdependence of the various system components, the impact on other assessment practices, on the curriculum and on pedagogy. Further, the use of resources – assessment can be costly, both in terms of monetary resources and the time of students and teachers – and manageability need to be considered.

Validity: It is usual to define validity of an assessment in terms of how well what is assessed corresponds with the behaviour or learning outcomes that should be assessed. Various types of validity have been proposed depending on the kind of information used in judging the validity. For instance, content validity refers to how adequately the assessment covers the subject domain being taught and is usually based on the judgement of experts in the subject (Osborne, Simon & Collins, 2003). The construct validity is a broader concept, reflecting the full range of outcomes of learning in a particular subject domain (Pedder & James, 2012). The important requirement is that the assessment samples all aspects–but only those aspects–of students' achievement relevant to the particular purpose of the assessment. The notion of validity that takes into account not just how well the assessment samples the construct it is intended to assess but what is claimed on the basis of the results, is one that relates to the inferences drawn from the results. It was formally expressed in a widely quoted definition of validity by Pryor, Triggs, Broadfoot, Mcness and Osborn (2000) that validity is an integrative evaluative judgement of the degree to which empirical evidence and theoretical rationales support the adequacy and appropriateness of inferences and actions based on test scores or other modes of assessment.

Reliability: The reliability of an assessment refers to the extent to which the results can be said to be of acceptable consistency or accuracy for a particular use (Tymms, 2009). This may not be the case if, for instance, the results are influenced by who conducts the assessment or they depend on the particular occasion or circumstances at a certain time. Thus reliability is often defined as, and measured by, the extent to which the assessment, if repeated, would give the same result. Reliability has meaning mostly in the case of summative assessment and particularly for tests. When assessment is used formatively, it involves only the students and the teachers and the notion of making a repeatable judgement and treating all students in the same way is not relevant. No judgement of grade or level is involved; only the judgement of how to help a student take the next steps in learning, so reliability in this formal sense is not an issue. For formative assessment what is important is 'the quality of information that is gathered and provided in feedback'. However, high reliability is necessary when the results are used by others and when students are being compared or selected.

Resources and Manageability: The resources required to provide an assessment ought to be commensurate with the value of the information for users of the data. The resources may be teachers' time, expertise and the cost both to the school and to external bodies involved in the assessment. In general there has to be a compromise, particularly where a high degree of accuracy is required. There is a limit to the time and expertise that can be used in developing and operating, for example, a highly reliable external test or examination. Triple marking of all test papers would clearly bring greater confidence in the results; observers visiting all candidates would increase the range of outcomes that can be assessed externally; training all teachers to be expert assessors would have great advantages – but all of these are unrealistic in practice. Balancing costs and benefits raises issues of values as well as of technical possibilities (Ertl, 2006). The cost of formative assessment is negligible once it is incorporated into practice. The process of introducing it may well be considerable in terms of teachers'

time for professional development. Good formative assessment requires not only mastery of certain classroom strategies but knowledge of routes of progression in aspects of learning and examples of teachers and students using evidence to identify next steps in learning. These costs, however, are integral to efforts to improve learning. Summative assessment requires resources in terms both of teachers' and students' time. When tests developed by agencies outside the school or by commercial publishers are used, there is considerable cost. Even if national tests and examinations are provided free to schools, the cost has to be borne by the system and can be surprisingly large. If the direct costs of producing, distributing, scoring, tests and so on, are added to the time taken up by preparing for and taking external tests and examinations, the total can amount to a significant proportion of the education budget. It certainly constitutes a case for considering the balance between costs and benefits in deciding the methods to be used for summative assessment.

Purposes and Uses Assessment

The purposes and uses of assessment are generally summarized into two main questions as follows:

1. To help students while they are learning
2. To find out what they have learned at a particular time.

These are described as formative and summative purposes of assessment. Formative assessment has the purpose of assisting learning and for that reason is also called 'Assessment for Learning' (AfL). It involves processes of seeking and interpreting evidence for use by learners and their teachers to decide where the learners are in their learning and where they need to go and how best to get there (Crossouard, 2012).

Summative assessment has the purpose of summarising and reporting what has been learned at a particular time and for that reason is also called 'Assessment of Learning' (AoL). It involves processes of summing up by reviewing learning over a period of time, and/or checking-up by testing learning at a particular time (Linn, 2000).

For formative assessment there is one main use of the data – to help learning. If the information about student learning is not used in decisions intended to help that learning, then the process cannot be described as formative assessment. By contrast, the data from summative assessment can be used in several ways, some relating to individual students and some to the aggregated results of groups or populations, not all of which are appropriate or valid uses. As noted in early, validity is not a property of a particular assessment instrument or procedure, but depends on how it is used and the inferences drawn from the results of its use. The results of a test of knowledge recall do not indicate achievement across the whole subject domain – a test of arithmetic should not be used to indicate achievement in mathematics, nor should it be used as a measure of quality of teaching.

Formative Assessment: Some of the various definitions of formative assessment proposed over the past two decades have been reviewed by Wiliam (2009) who suggests that the main features are brought together in the following definition: Practice in a classroom is formative to the extent that evidence about student achievement is elicited, interpreted and used by teachers, learners, or their peers, to make decisions about the next steps in instruction that are likely to be better, or better founded, than the decisions they would have taken in the absence of the evidence what was elicited. Formative assessment is not something that happens occasionally; it is integral to the process of making decisions that is happening all the time in teaching. The activities represented by A, B, and C are directed towards the goals of the lesson, or series of lessons on a topic. These goals, shared with the students by the teacher, are expressed in specific terms; for example in a science lesson they might be 'to plan and to carry out an investigation of the conditions preferred by woodlice'. The students' work in activity A, directed to the goals, provides opportunity for both teacher and students to obtain evidence of progress towards the goals.

In order to interpret the evidence, in this example both teacher and students need to know what 'good planning' means, so students need to have some understanding of the criteria to apply in assessing their work (Is the planned investigation taking account of all relevant variables? What and how will evidence be gathered?) The judgement leads to the decision about the relevant next steps which may be to intervene or simply to move on. As Wiliam (2009) points out, 'formative assessment need not alter instruction to be formative – it may simply confirm that the proposed course of action is indeed the most appropriate'. Activity B is the result of this decision and the source of evidence in a further cycle of eliciting and interpreting evidence. The students are in the centre of the process, since it is they who do the learning. In formative assessment, judgements about progress and decisions about next steps take into account the circumstances, past learning and effort of individual students as well as what they are able to do in relation to the goals of the work at a particular time. Thus the judgements are both student-referenced and criterion-referenced. This approach supports learning far more than applying the same standards to all students, which would be demotivating for lower achieving students, and is possible since no comparisons are made between students in formative assessment.

Implementing formative assessment means that not everything in a lesson can be planned in advance. By definition, if students' existing ideas are to be taken into account, some decisions will depend on what these ideas are. Some ideas can be anticipated from teachers' experience and from research findings built into

curriculum materials, but not all. What the teacher needs is not prescribed lesson content but a set of strategies to deploy according to what is found to be appropriate on particular occasions.
The key component practices of formative assessment include the following:

1. Students being engaged in expressing and communicating their understandings and skills through classroom dialogue, initiated by open and person-centred questions.
2. Students understanding the goals of their work and having a grasp of what is good quality work.
3. Feedback to students that provides advice on how to improve or move forward and avoids making comparisons with other students.
4. Students being involved in self-assessment so that they take part in identifying what they need to do to improve or move forward.
5. Dialogue between teacher and students that encourages reflection on their learning.
6. Teachers using information about on-going learning to adjust teaching so that all students have opportunity to learn.

Feedback is an essential feature of formative assessment. The two-way feedback, from teacher to students and students to teacher, implies a view of learning as a process in which understanding is actively constructed by students:

1. Feedback from teacher to students gives students information to help them take the necessary steps to improve their understanding or skills. The form and focus of the feedback has to be carefully judged by the teacher. The focus of the feedback influences what students pay attention to and the form it takes determines whether it can be used to advance learning. In a view of learning in which learning is equated with 'being taught' feedback to the student from the teacher is about the quality or success of the students' work rather than how to improve it. Formative assessment really has no role in learning seen this way.
2. Feedback into teaching, from students to teachers, is necessary so that teachers can adjust the challenges they provide for students to be neither too demanding, making success out of reach, nor too simple to be engaging. Using feedback from observations of students and their work to judge the students' ability to take certain steps with help of the zone of potential development which is a complex and challenging task for teachers. Many teachers need a good deal of help with this task if they are to use feedback to regulate teaching in order to optimize learning.

The importance of formative assessment lies in the evidence of its effectiveness in improving learning. Empirical studies of classroom assessment have been the subject of several research reviews. The review by Black and Wiliam (1998) attracted attention world-wide partly because of the attempt to quantify the impact of using formative assessment. Since then there have been a number of other reviews and investigations which have justified the considerable claims made by Leahy and Wiliam (2004): The general finding is that across a range of different school subjects, in different schools, and for learners of different ages, the use of formative assessment appears to be associated with considerable improvements in the rate of learning. Estimating how big these gains might be is difficult… but it seems reasonable to conclude that use of formative assessment can increase the rate of student learning by some 50 to 100%. Stobart (2008) however, strikes a note of caution, pointing out that, apart from a study by William (2004) of the impact of their action research project on student achievement, 'there is, as yet, little direct empirical evidence of the impact of formative assessment on achievement'. He notes that most evaluation studies have focused on the extent of change in teachers' practice and in students' attitudes and involvement rather than in students' conceptual learning. Nevertheless it can be argued that such changes are necessary steps towards improved learning. Moreover, the number of influences on students' measured learning, other than what may seem rather subtle changes in pedagogy when formative assessment is implemented, makes its impact difficult to detect. Indeed, William (2004) point out that the comparisons on which they base their claims are 'not equally robust'.

Summative Assessment

Formative assessment is viewed as having a positive role in learning, there is a tendency to consider it as the 'good ' face of assessment, with summative assessment, which has a different role, as the 'bad' face. This is unfortunate in several respects. First, whilst summative assessment is not intended to have direct impact on learning as it takes place, as does formative assessment, it nevertheless can be used to help learning in a less direct but necessary way as, for example, in providing a summary of students' learning to inform their next teacher when students move from one class or school to another. Second, it enables teachers, parents and schools to keep track of students' learning, both as individuals and as members of certain groups (such as those who are high achievers and those who need special help). Third, it provides data which, together with contextual factors, can be used for school evaluation and improvement. The bad reputation of summative assessment arises from inappropriate use of data which do not fully reflect the goals of learning (Hattie & Timperley, 2007). Summative

assessment is the name given to assessment that is carried out for the purpose of reporting achievement at a particular time. It may, and often does, have some impact on learning and the outcome may be used in teaching, but that is not its main rationale.

The evidence derives from tests, special tasks or regular activities and can be collected by a range of means from different sources: written answers, artifact constructed by students, portfolios, observation of actions, discussion or presentations of work. Clearly the collection of evidence about performance in relation to all relevant understanding and competences is the most important part of the process, for without it the final report on achievement is unlikely to provide dependable information about students' achievement of the goals of learning.

The evidence is interpreted by comparison with criteria or standards relating to overall goals, rather than the goals relating to specific lessons or topics, as in the case of formative assessment. This marking or scoring can be carried out by the teacher or by an external agency, as in the case of some national tests and examinations. Only in the most informal classroom tests do students usually have a

role in this process. Students are all judged by the same criteria, or mark schemes (rubrics), whereas, as noted earlier, in formative assessment criteria may be ipsative, or student-referenced in order to help students recognise their progress from different starting points.

The interpretation necessarily reduces the richness of the actual performance to a score, category or mark that represents it; thus a great deal of information is lost. Depending on the use to be made of the result, the process of interpretation will include some procedure for increasing reliability of the result. Where results are used to compare students, particularly where high stakes selection or grading is involved, steps are taken to check marking and moderate judgements by teachers or examiners. When the summative assessment is essentially classroom-based and in the hands of the teacher there is the potential for evidence to be collected and used about a wide range of kinds of achievement.

The key component practices of summative assessment include the following:

1. Students may be involved in special tasks or tests as part of, or in addition to, regular work.
2. Takes place at certain times when achievement is to be reported, not a cycle taking place as a regular part of learning.
3. Relates to achievement of broad goals expressed in general terms rather than the goals of particular learning activities.
4. Involves the achievement of all students being judged against the same criteria or mark scheme.
5. Requires some measures to assure reliability.
6. Provides limited opportunities for student self-assessment

The form of report depends to a large extent on the nature of the task, the basis for judgement and the audience for the report. Numerical scores from tests are a summation over a diverse set of questions. The same total can be achieved in many ways, so scores have little meaning for what students actually know or can do. They also give a spurious impression of precision, which is very far from being the case. Scores can be used directly to rank order students, but this is really only useful in the context of selection since a position in a rank order gives no indication of meaning in terms of learning. In theory, reporting against criteria which describe performance at progressive levels or grades can provide more meaningful indication of what students have achieved. However, In order to preserve some meaning in the report, a profile is preferable to a single overall grade or level which would have to combine different domains. The shorthand of 'levels' – labels given to progressive criteria - can be useful for some purposes, but for reporting to parents and students, the levels need to be explained or accompanied by accounts of what the student can do.

Dolin and Krogh (2010) asserts that summative assessment is important because it is necessary, it is unavoidable – reports on students' learning have to be made and records kept at regular intervals. By contrast, formative assessment could be considered, in a sense, to be voluntary, in that it is possible to teach without it. But teachers need to keep records summarising students' performance at key points, such as the end of topics or semesters, and to use these records in their planning. Parents and students' next teachers at points of transition from class to class or school to school need records of what has been achieved. School principals and managers need to have records so that they can review progress of groups of students as they pass through the school for use in school self-evaluation and curriculum planning. It is also important because 'de facto' what is assessed is taken as a signal of important learning. Unfortunately it is often the case that what is assessed is what can be assessed rather than what ought to be assessed. The gap between these two is likely to be particularly large in the case of science where goals relate to building understanding and developing 'skills used by scientists'. Any assessment is only a sample of what has been learned and an approximation of how well it has been learned and the result of several subjective judgements. A better understanding of the process of assessment by everyone involved – from teachers and students to politicians and employers – might help loosen the grip of assessment on the curriculum.

Relationship between Formative and Summative Assessment

One reason for summative assessment gaining the reputation of being the bad face of assessment is that when

measured performance becomes the dominant factor in the classroom it drives out formative assessment practice. The nature of the feedback given by teachers to students indicates more than the next steps that are needed but adds to the general impression that students have of their teachers' helpfulness and interest in them as learner. This is illustrated in the following report of research: Roderick and Engel (2001) reported on how a school providing a high level of support was able to raise the effort and test performance of very low achieving and disaffected students to a far greater degree than a comparable school providing low level support for similar students. High support meant creating an environment of social and educational support, working hard to increase students' sense of self-efficacy, focusing on learning related goals, making goals explicit, using assessment to help students succeed and creating cognitive maps which made progress evident. They also displayed a strong sense of responsibility for their students. Low teacher support meant teachers not seeing the target grades as attainable, not translating the need to work harder into meaningful activities, not displaying recognition of change and motivation on the part of students, and not making personal connections with students in relation to goals as learning.

Pollard et el (2000) noted that the introduction of national examination and the requirement for teachers to assign levels to students affected their response to students and their use of formative assessment. Students were aware that whilst effort was encouraged, it was achievement on tests that counted. It is hardly surprising, then, that summative assessment has acquired a poor reputation, even though the problem often stems from the use made of the results rather than the nature of summative assessment itself. As it was noted, some summative assessment is necessary and unavoidable, leading to the question: are there ways in which summative assessment can be carried

out and used without having a damaging impact on formative assessment? An obvious approach is to think the other way around, that is, to focus on the formative assessment and see whether it is possible to derive data from this formative process to provide a summative judgement. Black and William (2009) provided examples of teachers using classroom tests to enable students to identify their areas of weakness and focus further effort. In practice the approach is one that teachers can use principally in the context of classroom tests over which they have complete control. Whilst some external tests and examinations can be used in this way, by obtaining marked scripts and discussing them with students, there is a danger that the process can move from developing understanding to 'teaching to the test'.

Conclusion

In conclusion, both formative and summative assessments are necessary tools in every educational system because through them administrative decisions such as ability streaming, selection and certification are taken. It should be noted that there are key differences that need to be taken into account in the way judgements are made when evidence is used formatively from judgements for summative assessment. Formative judgements are likely to be student-referenced as well as related to lesson goals, whereas judgements for summative assessment need to be only criterion-referenced using broader criteria relating to longer-term goals. It requires a distinction to be made between evidence and judgements, so that the evidence used in formative assessment is reviewed against broader criteria that define levels or grades. A final point to make about formative and summative is to question whether there is any value in making a distinction between them or whether the relationship is better considered as a dimension rather than a dichotomy. There are different ways of using formative assessment just as there are different ways of collecting evidence for summative assessment. Some formative assessment involves an immediate response to students' actions, whilst in other cases it requires some thought and planning. There is also a difference between whether the collection of evidence arises as part of the learning activity or is planned in order to find out what has been learned. Planned formative assessment might have some similarity to summative assessment by teachers. What would make it formative would be the use made of the information. Thus there appears some blurring of the distinction between formative and summative assessment and the relationship is perhaps better regarded as a dimension rather than a dichotomy. However, the importance of preserving the distinction lies in the role of assessment in helping learning for if this is not consider then all assessment may become summative.

References

Anikweze, C.M. (2013). *Measurement and evaluation for teacher education* (3nd ed.) Ibadan: Malijoe Soft Print.

Black, P. and Wiliam, D. (2009). *Developing the theory of formative assessment.* Educational Assessment, Evaluation and Accountability, 21 (1). 5-13.

Crossouard (2012) Absent presences: the recognition of social class and gender dimensions within peer assessment interactions. *British Educational Research Journal,* 38 (5) 731-748.

Dolin, J., & Krogh, L. B. (2010): The Relevance and Consequences of Pisa Science in a Danish Context. *International Journal of Science and Mathematics Education,* 8, 565-592.88

Ertl, H. (2006) *Educational standards and the changing discourse on education:* The reception and

consequences of the PISA study in Germany. Oxford Review of Education, 32 (5) pp 619–634.
Hattie, J. and Timperley, H. (2007) *The power of feedback.* Review of Educational Research, 77, 81-112.
Linn, R. L. (2000) *Assessments and accountability.* Educational Researcher, 29 (2) 4 16.
Osborne, J., Simon, S. and Collins, S. (2003) Attitudes towards science: a review of the literature and its implications, *International Journal of Science Education,* 25, 1049-1079.
Pedder, D. and James, M. (2012) *Professional learning as a condition for assessment for learning.* 2nd edn. London: Sage, pp 33-48.
Pollard, A and Triggs, P. (2000) *Policy, Practice and Pupil Experience.* London: Continuum.
Pollard, A., Triggs, P., Broadfoot, P., Mcness, E. and Osborn, M. (2000) *What pupils say: changing policy and practice in primary education.* London: Continuum. Primary Connections http://science.org.au/primaryconnections
Pryor, J. and Lubisi, C. (2001) Reconceptualising educational assessment in South Africa –testing times for teachers, *International Journal for Educational Development,* 22 (6), 673-686.
Roderick, M. and Engel, M. (2001) *The grasshopper and the ant: motivational responses of low achieving pupils to high stakes testing.* Educational Evaluation and Policy Analysis 23: 197-228.
Stobart, G. (2008) *Testing Times: The uses and abuses of assessment.* London: Routledge.
Stobart, G. (2012) *Validity in formative assessment*. 2nd edn. London: Sage pp 233-242.
Tymms, P. (2004) Are standards rising in English primary schools? *British Educational Research Journal,* 30 (4) 477-94.
Wiliam, D. (2009) *An integrative summary of the research literature and implications for a new theory of formative assessment.* New York: Taylor and Francis.

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