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STANDARD SETTING IN THE TEACHING AND LEARNING PROCESS IN THE KENYA SCHOOL SYSTEM

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ABSTRACT

Standards are set at different levels to govern different requirements that collectively add up to the ingredients of quality education of a child. This study investigated whether or not there are quantitative standards of achievement for guiding teaching and learning in the school system in Kenya. It also investigated teachers' perception of their pupils' mastery of what they were taught in class. The findings were that such standards do not exist. Teachers use their previous year's mean scores and compare themselves with neighbouring schools to judge how well they are performing in national examinations. Teachers reported that their pupils do not master what they are taught. The study recommends change of teaching approach from content coverage to content mastery (mastery learning) by setting a minimum proficiency level of between 50-74% (62.5% on average) as a criterion to aspire to during formative assessment.

KEY WORDS: Standard Setting in Teaching and Learning

INTRODUCTION

Quite often, we hear stakeholders in education complaining that the quality and standards of education have gone down since the introduction of the eight years primary, four years secondary and at least four years university (8.4.4) system of education in Kenya. "When they leave school, today's youth are not able to do what we used to do when we left school" is a very common complaint among the parents who went through the seven years primary, four years secondary, two years higher and at least three years university (7.4.2.3) system of education in Kenya. What exactly do the older folks mean by "quality and standards of education"?

This paper attempts to

- investigate whether or not there are established quantitative standards of achievement to guide the teaching and learning process in the school system in Kenya; and
- propose such standards if they do not exist.

Literature Review

The definition of 'quality' education is controversial and subject to many interpretations (MacBeath, Schratz, Meuret and Jakobsen, 2000). An objective of the education system, increasingly in the minds of policy makers, is to prepare pupils for the labour market. The structures and requirements of this market are changing rapidly and there is great uncertainty about the qualifications that will be needed in the future world of work. At the same time, there are doubts as to whether rationalisation in industry and commerce will leave enough employment opportunities for all. MacBeath et al. (2000) record that knowledge is becoming outdated within very short intervals of time. They go on to say that about 80% of the technologies applied currently will be obsolete ten years later. This makes it problematic for education or enterprise to identify and define what should be learned at what stage, and what the most appropriate place for learning is. In light of this fact, education should focus on general skills of learning to learn, on the capacity to go on acquiring and reformulating knowledge long after school days are past. Simply stated, quality education is one

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that will give the individual competencies to adapt and contribute to the inevitable changes in society. Quality education is education for life. It must meet the social, political and economic needs of the generation that is living at the time.

The overall performance in national examinations has been wanting especially in Kenya Certificate of Secondary Education (KCSE) over the recent years. Tables 1 and 2 show a summary of both Kenya Certificate of Primary Education (KCPE) and KCSE performance in 11 (for KCPE) and 13 (for KCSE) consecutive years. Going by the definition of quality education given above, this overall performance, especially in KCSE, is not impressive, particularly in science and mathematics; the subjects that are crucial in industrializing Kenya by 2030.

Table 1
Performance (Raw Score %) in KCPE Subjects 1999-2009

	Subject Code					
	1	2	3	4	5	6
Mean of Means	41.7	51.2	48.4	53.8	59.1	63.7
Mean SD	14.6	14.9	18.6	15.8	15.8	15.4

Source: Kenya National Examinations Council Secretariat

Legend: 1= English; 2= Kiswahili; 3= Maths; 4= Science; 5= GHC/Social Studies; 6=RE;
This scenario may be attributable to the fact that the teachers do not have a quantitative standard to judge when significant learning has taken place in a topic/concept before they move on to the next.

Table 2
KCSE Performance (Raw Score%) in Selected Subjects 1997- 2009

	Subject Code								
	1	2	3	4	5	6	7	8	9
Mean of Means	18.2	35.5	44.3	39.3	47.5	29.2	29.4	22.3	44.9
Mean SD	16.7	11.4	14.1	15.2	17.4	12.8	13.9	13.1	15.8

Source: KCSE Newsletters 1997-2009

Legend: 1= Maths; 2= English; 3= Kiswahili; 4= Geography; 5= History/Government;
6= Biology; 7= Physics; 8= Chemistry; 9= Business/Studies

Data generated in this study revealed that 92.4% of the secondary school teachers and 82.8% of the primary school teachers were not satisfied with the overall performance in their subjects. This is shown in Table 3.

Table 3
Teachers' Satisfaction with KCSE Performance (Mean Scores)

	Responses			
	Yes	No	Omit	Total
Primary School Teachers	36 (17.2%)	173 (82.8%)	-	209 (100%)
Secondary School Teachers	31 (7.6%)	378 (92.4%)	-	409 (100%)

Source: The Survey Study by Researcher

The Inspectorate Department, under the Ministry of Education, was established in 1955 to maintain academic standards, among other functions (Government of Kenya, 1963). This department has since grown into the Directorate of Quality Assurance and Standards. Its function is to "establish, maintain and improve standards" (Ministry of Education Science and Technology, 2000). It is assumed that high standards will translate to quality education. Apparently, the task is therefore, that of defining standards because standards need to be set before they are maintained or improved.

'Standards' may be defined in terms of the content of the curriculum, pupils' performance, number and qualification of staff, size of classes, expenditure on educational materials, health and safety of pupils and a satisfactory environment for learning. In other words, standards are set at different levels to govern different requirements that collectively add up to the ingredients of the quality of education of a child. Fortunately, the minimum criteria for determining standards for all the above variables can be easily specified except those for determining performance. It is possible to determine the teacher-pupil ratio, teacher qualification, class size, expenditure on educational materials per pupil, health and safety standards that need to be met before a school can be licensed to operate, and the type of environment that is conducive to learning. But how can the minimum performance of the school output be determined? Should it be by use of the mean grade or the number of students who qualified to enter the next level of education? If the mean grade were to be used, what would be the acceptable cut-off mean grade? If the number of students qualifying to enter the next level of education is to be used, what would be the minimum acceptable number or what proportion of the total would be acceptable? Setting learning proficiency descriptors is a common practice in the developed world (Virginia Board of Education, 2008) and stakeholders are able to tell how much learning is taking place by using these descriptors to judge achievement. Research has shown that the professional teachers should set the standards for the inspectors to use professionally set standards as their starting criteria (Kogan and Maden, 1999). This is what happens in other professions like medicine. The professional medics set the standards and when medical inspectors go around inspecting medical facilities they use those standards to sanction operation of facilities that meet the standards or close the ones that do not meet the stipulated standards. It should not be any different for the teaching profession. While other stakeholders should participate in the process of standard setting, the Directorate of Quality Assurance and Standards should play the lead.

Standard Setting

An American newsletter (Improving America's School) asserts that the standards setting process typically includes the development of the following three components:

1) Academic content standards, which describe what every student should know and be able to do in the core academic content areas (e.g., mathematics, science, geography).
2) Performance standards or benchmarks (sometimes called indicators), which define excellent and good in terms of lower and upper real limits. They define how students demonstrate their

proficiency in the skills and knowledge framed by national content standards.

3) Proficiency levels which assign value to examples of student work expected at certain development levels (Anderson, L., Fiester, L., Gonzales, M., Pechman, E., 1996).

Content standards in reading require students to: construct, examine, and extend the meaning of literacy informative and technical texts through listening, reading and reviewing. For example, to demonstrate their knowledge of this standard, Standard VIII pupils must read a full-length passage from a text and answer questions requiring both brief and detailed responses.

Based on how pupils' answers demonstrate their understanding of the passage, the performance standard indicates they 'meet or exceed' the standard if their answers: accurately summarizes the story, identifies and discusses the characteristics of the type of literature and explains technical elements of the language and how it is used in the story. For a student to 'meet' or to 'exceed' the lower limit of the standard shows that he/she has mastered sufficient skills and knowledge in a particular content to warrant moving to the next content without risking slipping back to illiteracy. This standard, whether in essay or objective testing, needs to be quantified.

In the Kenyan situation, components (1) and (2) are addressed by the approved curriculum and the specific course and lesson objectives. What is not addressed is the quantitative proficiency at which these objectives should be achieved. It is this quantitative standard that teachers need to guide them in teaching. For example, suppose the lesson objective is that "At the end of the lesson, all (100%) learners will be able to factorize simultaneous equations involving two unknowns". This is a criterion alright, but it lacks the standard of achievement (minimum proficiency level) that will guide the teacher to tell whether or not to move to the next topic. Suppose 100% of the learners are able to solve only two out of 10 items correctly. Is this an indication that significant learning has taken place? Does the teacher move on or does he repeat the topic? In the absence of that standard, teaching and learning is left to the whims of every teacher and the result is low mean scores in KCSE. The implications of the KCSE performance over the years are that the Kenyan doctors, engineers and specialists of all kinds, were drawn from populations whose mean scores in mathematics and the sciences were below 20% and 30% respectively. This is a challenge that cannot be addressed by testing, no matter how good the tests are. It can only be addressed through a change of teaching approach. In order to improve achievement, therefore, teaching should change from curriculum coverage to curriculum emphasis, from coverage to mastery (Barr, 1985). In mastery learning, the minimum quantitative standard of achievement needs to be set before it can be maintained and improved.

Proposed Quantitative Standards of Achievement

Kiplinger (1997) records that in order to determine performance levels, cut off points that reflect what students in each performance level should know and be able to do must be established. The author further records that there are several methods used for setting performance level cut off points for large-scale assessment but the most commonly used method is the modified Angoff method. This method consists of several panelists who, individually, judge each item and give their estimate of the difficulty level of the test item-by-item. Then they discuss their opinions and moderate their judgments to arrive at a consensus/concurrence or at least convergence of their judgments on the p-values.

Bookmark procedure is another process used for setting standards. This procedure is derived from Item Response Theory (IRT) and it is whole-test-based rather than item-based. The steps in this method require actual student results on either the item pool or the test forms.

One of the major objectives of schooling is to enable learners to acquire and retain knowledge and skills. In essence, this is mastery and mastery is measured against a criterion. How much a learner has mastered in the school system in Kenya is determined through norm-referenced testing and therefore, to establish high standards of achievement in the norm-reference testing, it is necessary to set criteria/benchmarks that learners will aspire to.

A good norm-referenced test is one that will be able to reveal different levels of achievement among students. Research shows that such a test will have moderately difficult questions. Ebel and Frisbie (1991) record that the ideal difficulty of each item, and consequently the whole test, should be at a point on the difficulty scale midway between the perfect score (100 %

correct response) and the chance score. For purposes of deriving the lower limit of the benchmark, it may be necessary to use the objective test because the chance score can be estimated more precisely than in the essay test. This is not to say there is no guessing in essay tests. In fact the guessing factor in the essay may be more, especially when a learner responds to an essay item irrelevantly.

The chance score for a four alternative multiple choice test is 25%. For example, what would be the ideal minimum score that a pupil should manifest in a 100 items multiple-choice test of ideal difficulty with four alternatives? This score is the score exactly midway between the perfect score (100) and the chance score (25). If the pupil guessed through the test, he/she would be able to get a score of 25 and if he/she mastered the content he/she would get a score of 100. The score midway between these two scores is 62.5. The ideal score is made up of the chance score of 25 and the achievement score of 37.5 (25+37.5 = 62.5) for a multiple-choice test with four alternatives. This is shown in Figure 1. This is an ideal situation. Although the ideal is not easy to achieve, striving for it will definitely improve performance significantly and maybe push it within the bracket of 50%-74% which is considered proficient by all standards. Therefore, when a teacher is through teaching a concept and all the pupils in class are able to display a minimum mastery level of 62.5% achievement, then he/she should be able to tell that sufficient learning has taken place. This will result from change of teaching and learning approach and not from national testing and assessment. It is very unlikely that any learner who aims at this target in all his/her classroom experiences (norm-referenced) will have any problems in the quest for knowledge and skills in all areas of learning.

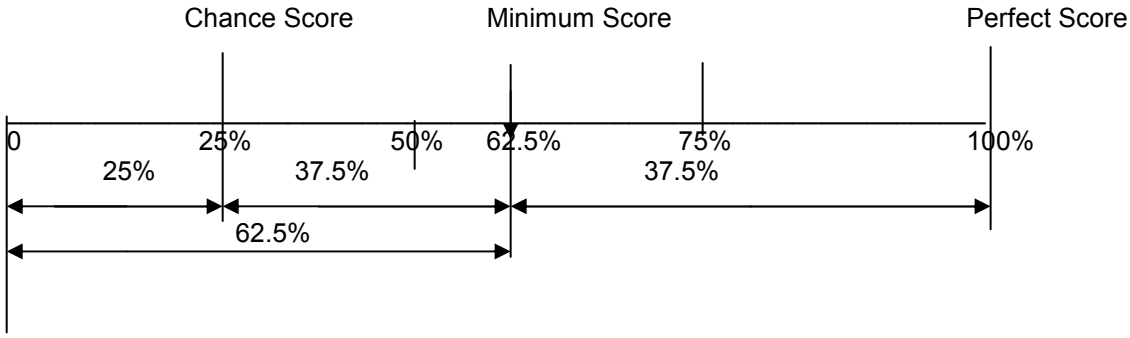

Figure1: Ideal Score for an Objective Test of ideal Difficulty

While the process of deriving this quantitative guideline of achievement is based on objective testing assumptions, it can be used to judge quantitative guidelines of achievement in essay testing. For example, the Virginia assessments cut off scores established by the Board of Education in March 2008 shows that in Class 8, pupils are expected to score 27 out of 50 (54%) items right to be considered proficient and 44 out of 50 (88%) to be considered highly proficient in science. In history, the equivalents are 26 out of 50 (52%) and 43 out of 50 (86%) respectively (http://www.doe.virginia.gov/VDOE/Assessment/ Solss3.pdf).

Perie (2008) records that in the process of standard setting, it is necessary to ensure flexibility when establishing cut off scores in order to provide all students with a reasonable opportunity to achieve proficiency. Just as there are no absolute criteria against which specific cut off scores can be evaluated, there are no perfect criteria for evaluating standard setting studies (Kane, 1994, 2001 cited in Perie 2008). Even then, it is still necessary to provide evidence that the cut off scores are reasonable and appropriate. The proposal given in Figure 1 is a firm guideline and it should be used with reasonable flexibility to help different learners to develop towards the proposed criteria. This criterion has been expanded to include cut off scores for different levels of proficiency in Table 4.

Table 4
Sample of Assessment Guidelines Standards (%)

Proficient	Learning Outcome
4. Advanced	
Score Range (75-100)	Distinguished achievement. In-depth understanding of academic knowledge and skills tested.
3. Proficient	
Score Range **(50-74)**	Competent in the important academic knowledge and skills tested. This range is an indicator of significant knowledge that ensures that a learner does not slip back to illiteracy. In this level and above, the learner becomes his/her own tutor; motivation is intrinsic rather than extrinsic.
2. Basic Proficiency	
Score Range **(26-49)**	Somewhat competent in the academic knowledge and skills tested.
1. Minimal Proficiency	
Score Range **(0-25)**	Limited achievement in the academic knowledge and skills tested. This level does not require a learner to have been taught. The score range can be acquired from his/her environment before institutions. Learning occurs by maturation.

Source: Adapted from Virginia Board of Education Standards of Learning Tests March 19, 2008

Incidentally, the average of level 3 proficiency in Table 4 is 62 (50+74÷2). This is not too far from the proposed mark of 62.5% in Figure 1.

Methodology

The researcher conducted a survey among curriculum implementers (primary school teachers handling Standard VIII and secondary school teachers handling Form IV [examination classes] and Quality Assurance and Standards (QAS) officers seeking too establish from the respondents several aspects of standard setting in the teaching and learning process. In this survey, 209 Standard VIII teachers, 409 Form IV teachers and 27 QAS officers were involved.

Sampling Procedure

A multi-stage sampling procedure was used. A sample of eighteen districts and two municipalities was purposively sampled from the list of districts that existed in 1992 to form the districts sample on the eight provinces. This list of districts forms the main communities of Kenya and any districts created after 1992 are only meant for administrative convenience. The new district boundaries do not affect the parameters that affect teaching and examinations significantly. Sampling of secondary schools was based on the schools that presented candidates for the KCSE examinations in 2008 from all eight provinces. Two secondary schools were selected from each of the sampled districts. These secondary schools dictated the primary schools that were included in the sample. Such primary schools were the ones that presented candidates for KCPE in 2008. For purposes of increasing efficiency of the study, the primary schools nearest to the sampled secondary schools formed the sample for the primary schools. Table 5 shows the eight administrative provinces, the number of secondary schools in each province that presented candidates for KCSE examinations in 2008 and the number of sample districts and secondary schools included in the sample. A corresponding number of primary schools from each province and district was also selected.

The sampling of the QAS officers was done accidentally at the headquarters and at the district and provincial offices. Only those officers that were available at the time of the study were involved. Among the 27 QAS officers involved, nine (9) were from the headquarters and 18 were from the district and provincial offices.

Table 5
Study Sample Sites

Province	Exam Centres	Districts Sampled	Secondary schools Sampled
Coast	170	2	4
Central	784	2	4
Eastern	763	2	4
Nairobi	132	1	2
R/Valley	934	3	6
Western	498	3	6
Nyanza	862	3	6
N/Eastern	25	2	4
Municipalities	2	2	4
Total	**4,168**	**20**	**40**

Data Collection

Data were collected using questionnaires for teachers and quality assurance and standards officers. The questionnaires sought to find out whether quantitative standards for assessing students' achievement existed and were made available to teachers to guide teaching and learning in the school system. Questionnaires also sought to establish whose responsibility it was to set standards of achievement.

Data Analysis

Responses from the questionnaires were analyzed manually using frequencies and tabulated for purposes of interpretations.

Results and Discussion

The QAS officers wee required to respond to questions asking them if there were any quantitative standards of achievement provided to the teachers to help in judging achievement in the teaching and learning process. Their responses are shown in Table 6. All (100%) QAS officers at the headquarters and 1.11% at the field respectively, reported that quantitative standards for judging performance in examinations in the school system exist. These data show contradiction between the two groups of officers. When this type of contradiction arises, one is likely to believe the report of the officers on the ground rather than the report of the officers at the headquarters. In this case, one is likely to believe that quantitative standards do not exist.

Table 6
Existence of Quantitative Standards in Schools

QAS CADRE	RESPONSES		
	Exist % Do not Exist %	Omit%	Total
H/Q	9 (100%)		9
Field	2 (11.1%)	16 (88.89%)	18
Total	11	16	27

Teachers in both primary and secondary schools were asked to indicate whether their pupils mastered what they were taught in class. Their responses are shown in Table 7.

Table 7
Teachers' Report of Proportion of Learners Mastering What They are Taught

Mastery Levels	Primary School	Secondary School
Well	179 (85.5%)	271 (66.3%)
Very Well	26 (12.4%)	128 (31.3%)
Perfectly Well	4 (1.9%)	10 (2.4%)
Total	209 (100%)	409 (100%)

Table 7 shows that 85.5% of the primary school teachers and 66.3% of the secondary school teachers reported that their students do not master what they (teachers) teach them. These responses show that there is need to change the teaching approaches to improve performance. Performance can only be improved through teaching and not testing. Research studies show that when teachers require that pupils should show minimum mastery of content, the pupils tend to achieve higher levels. When a unit-quiz fails to reach a predetermined level of excellence (usually 90%) remediation is required (Kulik, 1988).

Table 8
Quality Assurance Officers' Perception on Who Should Set Standards

QAS CADRE	Agent Perceived as a Standard Setter					
	Teachers	QAS	QAS& Teachers	KIE,KNEC &QAS	Spoilt Cases	Total
HQs Officers	3(33.33%)	**2(22.22%)**	2(22.22%)	-	2(22.22%)	9
Field Officers	6(33.33%)	**6(33.33%)**	3(16.66%)	1(5.55%)	2(11.11%)	18
Total	**9(33.33%)**	**8(29.62%)**	**5(18.51%)**	**1(3.70%)**	**4(14.81%)**	**27**

The QAS officers were asked to indicate their perception of who is responsible for setting quantitative standards of achievement in the teaching and learning process. A mere 29.62% of the QAS officers perceive the task of setting standards as their (QAS) responsibility exclusively. There is a difference of opinion between the QAS officers in the field and those at the headquarters in their perception. More officers in the field (33.33%) than in the headquarters (22.22%) perceive the task of setting standards as a responsibility of QAS (Inspectorate) officers. In general, most quality assurance officers perceive the task of setting standards more as a responsibility of others (teachers, Kenya Institute of Education (KIE) and Kenya National Examinations Council (KNEC) than it is their responsibility. This may explain the fact that since 1955 when the inspectorate (QAS) was established, no efforts were made to establish quantitative criteria for judging acquisition of effective learning. After all, the inspectorate (QAS) judges the effectiveness of the teacher delivering a lesson and not the effectiveness of the learner mastering the content taught. Even then, the standard of delivery of a lesson is judged qualitatively using a three-point scale of excellent, good and poor, which scale is too short to discriminate performance effectively.

Teachers in both primary and secondary schools were asked to indicate what most of the teachers spent their time doing in school. The results of their responses are shown in Table 9.

Table 9
Purpose for which Most Teachers and Schools Prepare their Pupils

Purpose	Primary	Secondary
Mastering test-taking skills	110(52.6%)	295(72.1%)
Covering & mastering curriculum content	99(47.4%)	114(27.9%)
Total	**209(100%)**	**409(100%)**

Fifty two percent (52.6%) of the primary school teachers and 72.1% of the secondary schools teachers reported that they spent their time teaching pupils to master test-taking skills. This means that all the time needed for teaching is misappropriated to testing. As pointed out earlier, learning and performance can only be improved by teaching and not by testing, no matter how good the tests are.

CONCLUSION

The findings of this survey revealed that quantitative standards of achievement to guide the teaching and learning process do not exist. Presumably, teachers use their previous years' performance or that of neighbouring schools as benchmarks to judge improvement or otherwise in performance. This assumes that the previous years' or the neighbouring school's performance was good in the first place. It is not clear to the curriculum implementers who should be responsible for setting minimum quantitative standards of performance in the school system. In order to maintain standards it is necessary to set them first.

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