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Policy brief

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Diagnostic approaches in student assessment: A tool for classroom teachers

“Students’ assessment results are traditionally presented in the form of grades, rankings and mean scores. But about one-third of grade 3 students in Kenya are doing math below their grade level; unfortunately, the classroom teacher cannot tell this or even determine what students know and what they do not know.”¹

Introduction

There is no known single approach through which students learn best. Students come to school, and by extension, the classroom, from various backgrounds. They bring to the classroom experiences from home and the environment. As they progress through the school system, they gain more experience through interacting with their teachers, peers, libraries, laboratories, and play. To measure students’ academic progress in school, teachers normally administer tests whose results are reported using both numerical and letter grades, ranking students from highest to lowest, and using mean scores.

While these traditional approaches of presenting students’ progress in learning are important, they do not provide an

opportunity for the teacher to understand what his students know or do not know. For instance, a grade A is simply interpreted to mean high test scores; in ranking, top ten students are viewed as the best students in class. What this presentation of assessment results does not tell us is the students’ grade-competency level. In this policy brief, we propose an approach the classroom teacher can use to evaluate the individual student so that they can better determine, for example, areas of competency in a specific subject and areas for remedial learning.

It is important for the teacher to know this as it informs pedagogical decision making inside the classroom, including specific teaching styles to use during instruction to support students who are at different competence levels, and especially those farthest left behind.

¹ This policy brief was drafted by Moses Ngware of APHRC.

Student Assessments

In Kenya, primary and secondary school students are assessed through internal and external examinations. Internal examinations include continuous assessment tests developed and administered by the classroom teacher. The external examinations include sub-county, county, and national assessments. Sub-county- and county-based examinations are developed jointly by schools and teachers and centrally administered. In many instances, such assessments are used to predict the outcomes of national examinations, which sometimes are also used to rank schools and students.

These very high-stakes examinations are used to rank schools by computing a school mean score and screen which students will proceed to secondary school and/or tertiary institutions including university. Such activities tend to benefit average students especially because school level results tell us about means and not, for example, proportion of students who demonstrate a certain level of competence or skill. In fact, these examinations place more emphasis on school level targets (such as how many grade A results did a school produce) and hardly do they have individual student level targets (such as at what competence or skill level is a student). On the other hand, national examinations are organized and supervised by the Kenya National Examinations Council ^[2]. Ideally, they are meant to assess what a student has learnt over the period of study. They assess the mastery of the curriculum covered and a student is provided with a score and/or grade.

Based on the results of these assessments, various decisions are taken at school level. For instance, a school ranked in the bottom 10% may decide to send a few of its teachers for a one-day visit study tour to a high performing school to learn how they operate or how they manage to be at the top. The lessons learned, though good, are mainly at school level and not at individual student level.

These examinations are also used by schools to justify extra or remedial lessons, especially for final year students. Further, school managers and Parents Teachers Associations use these results to prevail upon parents to 'motivate' teachers to provide extra tuition. This motivation comes in form of financial rewards, holiday trips within Kenya among other forms.

Impact On Learners, Limited Data For Teachers

The current assessment practices are not effective in diagnosing learning difficulties among students, nor are they currently designed to do so, to the detriment of both students and teachers. Research by the African Population and Health Research Center (APHRC) shows that nationwide repetition rates, mainly due to poor academic performance, are above 10%. At grade three, about two in every three students could demonstrate numeracy competencies at grade level [1,3]. Furthermore, using the traditional assessment practices, teachers hardly know what skills and competencies their students can demonstrate.

Instead, teachers know the extent to which their students can demonstrate mastery of the curriculum. To support below-average learners, it is imperative that teachers understand the former. Failure to diagnose what students have learnt means

that a large proportion of learners will proceed through the school system without gaining the skills needed to realize their full potential.

Diagnosing Student Learning

In education measurement, there exists practical approaches (such as the Rasch procedures) for diagnosing what a student has learned relative to what he/she should learn. Such approaches assume that students with high academic ability will score high, and vice versa. They allow for estimates for student academic abilities and the level of difficulty of the assessment items to be calibrated on a common interval scale. Using these procedures, test item difficulty can be related to the student academic abilities, thus revealing ceiling and floor effects, which enable teachers to adjust the level of instructions to match learners' academic ability.

In addition, the approaches reveal the ability of a test item to discriminate between groups of students who are at various levels of academic abilities or achievement. This is important for classroom teachers in the provision of individualized instructions to students who may not be performing at their grade level.

This approach can also establish item bias, that is, the bias associated with individual characteristics of sub groups of students, for instance social economic status, age, and gender. The beauty of this approach is that computers can conduct the analysis, producing information the classroom teacher can then use to identify the competency levels of his/her students. Each of the competency levels has grade-specific test items to assess it. In addition, the classroom teacher will have specific results for each learner that may enable them to tailor instructions including remedial activities as may be needed.

What Is Being Done?

To mitigate the inadequate diagnoses of student learning inside the classroom, the Ministry of Education, Science and Technology and the Teachers Service Commission (TSC) have put in place a teacher's professional development program as a way of improving the quality of teaching. In addition, schools have been supplied with teaching and learning materials under the Free Primary Education program. However, more needs to be done to strengthen the assessment aspects of the professional development program if student learning is to be effectively diagnosed. For example, the professional development program should emphasize the 'how to', so that teachers are equipped to diagnose individual student learning needs.



² A mathematical procedure that can be used to measure a psychological trait in a student, such as academic ability.

1

Recommendation 1

The Ministry of Education, Science and Technology, and the TSC should require classroom teachers to diagnose their students learning using competency benchmarks and not just curriculum mastery. The main concerns about implementing this practical approach is the capacity of teachers to use the learning diagnostic tools available in education measurement literature; and how this impacts on classroom management practices and what teachers are used to. The concern could be addressed through the use of education technology (EdTech) to domesticate the approach and strengthen the capacity of teachers to use the approach.



A shift from the traditional assessment practices to diagnosing students' learning needs

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Recommendation 3

Most teachers and education managers agree that diagnostic assessment should be utilized in classrooms; unfortunately, it is not. To implement this approach of diagnosing individual student learning, two key entry points are instrumental. First, primary and secondary school teachers go through a pre-service program that trains them on how to teach and examine learners. The 'how to' diagnose student learning can be effectively taught and practiced during teacher's pre-service training. Second, the Ministry of Education, Science and Technology has institutions whose mandate is to strengthen the capacity of teachers to effectively teach, among other things. These institutions implement in-service programs and it is therefore possible to include a module on diagnosing individual student learning needs targeting classroom teachers.



Entry points for diagnostic assessments in schools



Promote pedagogical skills that focus on facilitating the individual learner to learn

2

Recommendation 2

Teachers must develop effective pedagogical skills that focus on an individual learner such as discovery and cooperative learning. Such skills can provide opportunities for diagnosing learning at the individual level, for those students who lag behind the most. Currently, teachers report that their focus is on individual learners, but there is nothing in their teaching practice to support this claim. In fact, command style (teachers taking full control of instructions) of teaching predominates most of the math lessons in Kenyan primary schools. Once teachers get used to lecturing to a group of learners, as opposed to facilitating an individual to learn, they apply similar thinking in students' assessment where the emphasis is ranking learners from best scorer to the last as a measure of progress. When more emphasis is placed on facilitating the individual to learn, the assessment will follow similar thinking.



Facilitate the shift to diagnostic assessment by aligning assessment results to learning outcome benchmarks

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Recommendation 4

In Kenya, there exists learning outcome benchmarks developed through a consultative process spearheaded by the National Assessment Center, a government body mandated to monitor learning outcomes, and the Kenya Institute of Curriculum Development that is responsible for the competency based curriculum. However, these benchmarks are not referenced in the student assessment process. For instance, in an internal examination, the teacher should be able to know the individuals who have attained the specified benchmarks. This is important for the teacher in providing the much needed support to the learners based on what they know or do not know.

Conclusion

This policy brief offers a procedure for use by teachers and the school system to assess student achievement based on pre-determined competency levels and national benchmarks. It offers education practitioners an opportunity to use assessment data for pedagogical decision making inside the classroom. Teachers and school managers can group test items based on the levels of difficulty and/or use the analytical approach described in this brief to identify how well their students are learning compared to curriculum expectations. The results of such analyses could inform instructional strategies and identify students that need scaffolding the most, and especially those farthest left behind.

For more information contact: Moses Ngware – mngware@aphrc.org

References

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