Making the grade

Access to and completion of primary school has significantly expanded in recent years but can yield disappointing results if accompanied by reduction in education quality. The extent of student learning and skills acquisition measured through test scores is crucial to assess the effectiveness of any investments in education. Early grade reading and math skills are the fundamental building blocks. Children who fail to develop basic skills early in their education are more likely to lag behind in the future.

Because tests of basic literacy and numeracy are not implemented on a wide scale at an early stage of schooling and with greater scarcity of test results in Africa, a series of student assessments in Sub-Saharan Africa, known collectively as “Making the Grade” (MTG), was undertaken in 2009-2010 by the Africa Program of Education Impact Evaluation. MTG was designed to provide a simple and consistent overview of basic reading and math skills in a range of African countries, to characterize the current state of education quality in those countries, and to provoke further discussions and research.

Literacy and numeracy assessments

The assessments targeted primary school pupils and consisted of basic mathematics and reading skills test administered by trained enumerators. The results of the assessments conducted in sub-Saharan Africa are reported for The Gambia, Ghana, Liberia, Sierra Leone (numeracy only), and Senegal. In each country, schools and students from two grade levels were randomly selected to participate in the assessment. The sample size varies from 38 schools (Senegal) to 178 schools (the Gambia) and from 835 students (Liberia) to 16113 students (Sierra Leone).

The literacy assessment was administered orally to one child at a time. It included elements of the Early Grade Reading Assessment (developed by RTI International) and comprised of three sections:

1. **Letter name knowledge**
   Students were given one minute to read as many letters as possible on a chart containing a total of 98 or 100 letters arranged in several rows.

2. **Passage reading**
   Students were then given a written passage to read, including between 9 and 12 short sentences.

3. **Reading comprehension**
   To gauge the extent to which children understood the passage read, they were then asked to answer four or five reading comprehension questions.

The written numeracy test lasted 25 minutes and comprised a standard battery of 32 to 38 questions covering the basic areas of arithmetic (addition, subtraction, multiplication, and division).

Literacy and numeracy results

Even though test instruments used were very similar, absolute results are not fully comparable across countries because cultural differences are reflected in the literacy test (e.g., names of places and characters used) and protocols for implementation were
not identical. Nevertheless, some standards can be used to gauge country results. US benchmarks for these assessments suggest that pupils who can name less than 40 letters per minute in kindergarten and/or read less than 110, 118, 124, 125 words per minutes in grades 3, 4, 5 and 6 should be considered at risk. Furthermore, in cognitive neuroscience it is considered that, to understand a text, the brain must process words at a minimum rate of 35 to 60 words per minute.

**Ghana**

In grade 3 and 5, average pupils name 50 and 70 letters per minute and read 35 and 67 words per minute. Average reading skills are about half the US standards, but sufficient for text comprehension. Among assessed pupils in grade 3 and 5, 32 percent and 63 percent can read at least 45 words per minute while 22 percent and 6 percent of them could not read a single word. The average reading comprehension test scores are 37 percent in grade 3 and 58 percent in grade 5. Girls and boys perform equally well except in the letter naming assessments where boys in grade 5 score higher.

Numeracy average scores are 68 percent and 81 percent on additions and 30 percent and 57 percent on multiplications for grade 3 and 5 respectively. Furthermore, 17 percent of 3rd graders and 5 percent of 5th graders could not resolve a single subtraction. Performance gaps between genders are pervasive. Boys do consistently better than girls in all types of numerical problems.

**Liberia**

Average scores on the letter naming and passage reading tests are 77 and 90 letters per minute and 53 and 66 words per minute for 3rd and 5th graders respectively. Reading fluency stands at half the US benchmarks but within the minimum range for comprehension. The 45 words per minute threshold is attained by 85 percent of 5th graders and 64 percent of 3rd graders and very few students cannot read a single word: less than 1 percent in grade 3 and none in grade 5. This results in good comprehension test scores with averages of 69 percent (grade 3) and 79 percent (grade 5) and a majority of students scoring at least 80 percent. Boys significantly outperform girls only in grade 5 passage reading and grade 3 reading comprehension.

On average, pupils score 74 percent (grade 3) and 78 percent (grade 5) on additions and 44 percent (grade 3) and 53 percent (grade 5) on multiplications. Scores of zero are almost as rare for math as for reading: 5 percent of 3rd graders and 1 percent of 5th graders could not solve a single subtraction problem. Numeracy skills of boys and girls are similar except for additions in grade 5 and subtractions in grade 3 where boys perform significantly better.

**The Gambia**

In grade 4 and 6 respectively, average performances on letter naming and reading fluency are 56 and 77 letters per minute and 30 and 65 words per minute. Reading fluency is about one fourth (grade4) and half (grade 6) of the US standards and falls slightly below the neuroscience lower bound in grade 4. Among tested students, 25 percent (grade 4) and 56 percent (grade 6) could read more than 45 words per minute and 20 percent (grade 4) and 6 percent (grade 6) could not read a single word. Average comprehension test scores are therefore low at 36 percent (grade 4) and 59 percent (grade6). On all literacy assessments, boys outperform girls significantly.

Average math scores are 60 and 83 percent (grade 3 and 5) on additions and 23 and 53 percent (grade 3 and 5) on multiplications.
There are a significant numbers of low and high performers on subtraction problems: 37 percent (grade 3) and 18 percent (grade 5) could not solve a single problem and 8 percent (grade 3) and 26 percent (grade 5) obtained a score higher or equal to 87.5 percent. As for literacy skills, boys’ performance exceeds girls’ in all arithmetic areas.

**Senegal**

Average grade 3 and 5 students name letters at a rate of 29 and 64 letters per minute and read the text at a rate of 14 and 45 words per minute. Reading fluency rates are thus one fourth (grade 3) and half (grade 5) of the US standards and 3rd graders’ fluency falls considerably short of the neuroscience lower bound. Besides, the proportions of grade 3 and 5 pupils reading more than the 45 words per minute are 10 percent and 65 percent and zero scores are common (20 percent) in grade 3 but rare in grade 5 (1 percent). Average comprehension test scores are correlated with reading fluency. Mean 3rd and 5th graders respectively score 27 percent and 57 percent.

Average numeracy scores are 51 percent (grade 3) and 85 percent (grade 5) on additions and 19 percent (grade 3) and 75 percent (grade 5) on multiplications. Akin to reading fluency, an important proportion of zeros, 38 percent, are observed in grade 3 for subtractions. To the contrary, in grade 5, there are 3 percent of null and 33 percent of perfect subtraction scores. Gender gaps are only significant in grade 5 and favors boys’.

**Sierra Leone**

Average math scores in grade 3 and 4 respectively are 55 percent and 66 percent on additions and 25 percent and 38 percent on multiplications. Subtraction scores distribution reveals few average students and a considerable proportion of extremes. In grade 3, 21 percent and 2 percent of students have null and perfect scores and in grade 4, 10 percent and 4 percent of them do. Boys score significantly higher than girls on all types of problems and the score gap widens from grade 3 to 4.

**Policy recommendations**

Most students in the five countries under observation do not master basic literacy and numeracy skills. Systematic skills assessment is only the first step: it points out the problem but not the solutions needed to enhance the quality of education and learning achievement. The Africa Program of Education Impact Evaluation (APEIE) is working in 14 Africa countries to test the range of education policies that may help increase education quality. The interventions that are being tested include: (i) improving accountability structures within schools through greater parental and community participation, performance–based contracts and monitoring practices; (ii) releasing resource constraints and increasing decentralization of budget decisions through school grants; (iii) improving availability of learning materials and reducing class size through double shift; (iv) introducing e-assisted learning and books; and (v) improving teacher performance through distance learning and incentives. The results are starting to provide much needed guidance to improve education policy.

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