



## EdData II: Education Data for Decision Making Effective Teaching in Sub-Saharan Africa

Across most societies, people commonly believe that educational systems are only as good as their teachers. Although teachers are valued not only as teachers, but also as caretakers of children, the effect of individual teachers on student learning varies widely. Some teachers are more adept than others at facilitating student learning. These differences have sparked interest in what comprises effective teaching.

What is effective teaching? Unfortunately, the majority of the evidence available to answer this question involves proxies for effective teaching, rather than actual assessment of teacher practices in classrooms. Examples of proxy indicators are teacher qualifications, content-specific knowledge, conditions of teaching and learning, teacher absenteeism, attrition and retention, and teacher remuneration. Data from these indicators frequently are collected and used to judge the relative effectiveness of teaching. By contrast, evidence from direct observation of classroom practices and pedagogy has been underemphasized in both policy and research.

Proxies like those listed above form part of a system of traditional overreliance on student outcomes and teacher and school characteristics to define effective teaching. This brief argues for the importance of differentiating between (1) proxy indicators and (2) empirical evidence on teachers' classroom practices and pedagogical moves (teachers' use of and movement between various pedagogical practices during lessons) that reveals the true quality of instruction.

Effective teaching can be understood as the interplay of the four components outlined in **Figure 1**. Of the four components, information on teacher characteristics and student learning outcomes predominates in policy and research arenas. As a consequence, certain teacher characteristics have come to be interpreted as defining "qualified teachers" (i.e., teachers who have certain personal characteristics or professional attributes), and certain student learning outcomes have come to mean "successful teaching" (because students perform well on assessments). In turn, qualified teachers and successful teaching have become conflated with *effective teaching*.

This brief does not share that interpretation. However, this is not to say that teacher characteristics and student learning outcomes are not important to effective teaching; they are. Rather, no single one of the components is sufficient for a complete understanding of effective teaching.

Proxy indicators for each of the four components do appear in the existing body of research and policy. Some of the components are less represented than others, however. In particular, the teaching practices component—which involves looking at measures of classroom instructional processes—has great potential for useful and important insights, yet is infrequently studied and is disproportionately absent from policy. This component is where we begin our discussion. The policy recommendations



**Figure 1. Components of effective teaching**

interspersed in the text boxes below suggest ways to positively enhance instructional practices in sub-Saharan African classrooms.

### Teachers' classroom practices and pedagogical moves

Some programming interventions do monitor actual classroom practices and teacher-pupil interactions, to a certain extent. However, rarely—if ever—are they monitored at the national or international level,

*Recommendation:* Establish baseline practices that constitute “quality teaching” and desired instructional behavior. Rather than prescribing teacher behaviors, policies should encourage nonnegotiable hallmarks of best classroom practices, while allowing room for teachers’ professional judgment.

reported on, and infused into policy debates. Although items to gauge practices and interactions are beginning to appear in large-scale international assessments (PISA, TIMSS, PIRLS),<sup>1</sup> these aspects also may be studied through direct classroom observation. Data from observations and surveys show that pockets of good practices exist across classrooms in sub-Saharan Africa. The subsections below highlight contexts where some of these positive approaches are in

action and where there is room for introducing or further encouraging such practices.

### Teacher actions during classroom observations

From direct observations of classrooms in Kenya, Mali, Rwanda, and Tanzania, we know that teachers are typically teaching to the whole class rather than at the small group or individual level. For example, a baseline assessment in classrooms in Kenya in January 2012 revealed that textbooks were being used infrequently (around 22% of the time), and very little time (13% of the lesson) was spent actually reading during the reading lesson, as teachers were busy with monitoring and listening to pupils.<sup>2</sup> In Rwanda, a 2011 assessment with an observation component found that teaching at the whole-class level was the primary pedagogical grouping method, and teachers’ most frequently observed action was writing on the blackboard.<sup>3</sup>

In Kenya, the students in classrooms where silent reading or individual worksheets were employed tended to receive higher reading scores.<sup>4</sup> Further positive correlations were found in Tanzania between reading scores and teachers’ use of whole-class instruction and individual reading aloud. That is, high-performing classrooms (as measured by Early Grade Reading Assessment [EGRA] scores) tended to see the teacher start with direct instruction to the whole class, followed by quick transitions between instructional approaches, which allowed for more student engagement. Such transitions occurred within 6 minutes of the start of the direct instruction for high-performing classes versus within 10 minutes for low-performing classes. Higher-performing classrooms also had pedagogically agile teachers who would interrupt the lesson to address student concerns or questions on the material.

### Use of participatory techniques in classrooms

Generally speaking, participatory methods of teaching, which include engaging students through asking and answering questions and discussing lesson content, are infrequently used across sub-Saharan African classrooms. Data show that more classrooms use passive engagement in lessons, where students respond when called on and typically do more listening than discussing. In Kenya, for example, the baseline assessment documented that activities comprising passive engagement with lesson content

<sup>1</sup> PISA: Programme for International Student Assessment; TIMSS: Trends in International Mathematics and Science Study; PIRLS: Progress in International Reading Literacy Study.

<sup>2</sup> RTI International. (2012). *The Primary Math and Reading (PRIMR) Initiative: Baseline report*. Prepared for USAID under the Education Data for Decision Making (EdData II) project, Task Order No. AID-623-M-11-00001 (RTI Task 13). Research Triangle Park, NC: RTI International. Retrieved from [http://pdf.usaid.gov/pdf\\_docs/pa00hx75.pdf](http://pdf.usaid.gov/pdf_docs/pa00hx75.pdf)

<sup>3</sup> DeStefano, J., Ralaingita, W., Costello, M., Sax, A., & Frank, A. (2012). *Early grade reading and mathematics in Rwanda: Final report*. Prepared for USAID under the EdData II Project, Task Order No. EHC-E-07-04-00004-00 (RTI Task 7). Research Triangle Park, NC: RTI International. Retrieved from [http://pdf.usaid.gov/pdf\\_docs/pdact621.pdf](http://pdf.usaid.gov/pdf_docs/pdact621.pdf)

<sup>4</sup> See RTI International (2012).

took up most of the class time, leaving little time for active engagement activities such as posing and answering questions or solving problems as a class.

### Reactions to pupil work and pupil responses: Constructive/reinforcing or non-reinforcing pedagogical moves

One important area of pedagogical moves is how teachers react to their pupils' work and to their pupils' responses during classroom instruction. Here, we can differentiate between constructive, or reinforcing, moves (teacher actions that support and foster student learning) and non-reinforcing moves (teacher actions that discourage student learning, whether implicitly or explicitly). Constructive or reinforcing moves include repeating questions or encouraging students to try again, as well as recognizing students' good performance; whereas non-reinforcing moves include scolding for incorrect responses, asking another student to respond to the same question, or not recognizing pupils' good performance. In South Africa, 24% of pupils interviewed in a 2010 study reported that teachers used reinforcing moves when a question was answered correctly; however, over three-quarters reported non-reinforcing moves if a question was answered incorrectly.<sup>5</sup> In Tanzania, a 2014 study found that a greater portion of students (51%) reported constructive moves if a question was answered correctly. However, students also reported that non-reinforcing moves were used, including a significant minority (44%) who reported that teachers hit them if they were unable to answer a question in class.<sup>6</sup>

*Recommendation:* Devise measures of, and start collecting data on, the processes of teaching. Involving school inspectors to engage in productive dialogues with teachers, observe classrooms, gather data on classroom teaching and learning practices, and report back to the education ministry in low-stakes, anonymous ways would establish a rich store of data and evidence.

### Monitoring pupils' progress

It is reasonable to expect teachers to use more than one method (beyond the ubiquitous written tests) for assessing student progress and to shape their teaching practices. However, data collected in Tanzania and Zambia indicated that this was not happening. Teachers in the 2014 study in Tanzania most frequently (87% of the time) used written and oral assessments to grade students. Less than one-third were using assessments in a formative way (to gauge student understanding of instructional content, to adapt teaching to better suit the students' needs, or to plan future learning activities). In Zambia in 2012, nearly all teachers were using written assessments to gauge students' knowledge and abilities, yet less than half reported using other means (homework or oral evaluations).<sup>7</sup>

From here, we turn from classroom practices to the proxy indicators.

### Teacher qualification

Traditionally, the teacher qualification indicator centers on degrees conferred and national qualifications met. Pre-service and in-service training are also common aspects of teacher qualification. Observers may assume that these are rigorous hurdles teachers must clear, yet that is not always the case. For example, training depends on the quality of trainers and mentees, as well as the materials at their disposal. And as seen in contexts such as Tanzania, Malawi, and Nigeria, underqualified or unqualified

<sup>5</sup> Mulcahy-Dunn, A., Crouch, L., Pereira, C., Mayet, A., & Argall, J. (2010). *Education support to OVC in South Africa: Initial assessment and household survey*. Prepared for USAID under Cooperative Agreement No. 674-A-00-09-00054-00. Research Triangle Park, NC: RTI International.

<sup>6</sup> Brombacher, A., Nordstrum, L., Davidson, M., Batchelder, K., Cumiskey, C., & King, S. (2014). *National baseline assessment for the 3Rs (reading, writing, and arithmetic) using EGRA, EGMA, and SSME in Tanzania. Study report*. Prepared for USAID under the EdData II project, Task Order No. AID-621-BC-13-00001 (RTI Task 24). Research Triangle Park, NC: RTI International. Retrieved from [http://pdf.usaid.gov/pdf\\_docs/pa00k5cn.pdf](http://pdf.usaid.gov/pdf_docs/pa00k5cn.pdf)

<sup>7</sup> Collins, P. De Galbert, P., Hartwell, A., Kochetkova, E., Mulcahy-Dunn, A., Nimbalkar, A., & Ralaingita, W. (2012). *Pupil performance, pedagogic practice, and school management: An SSME pilot in Zambia*. Report prepared for USAID under the EdData II project, Task Order No. EHC-E-07-04-00004-00 (RTI Task 7). Research Triangle Park, NC: RTI International. Retrieved from [http://pdf.usaid.gov/pdf\\_docs/pa00hvcv.pdf](http://pdf.usaid.gov/pdf_docs/pa00hvcv.pdf)

contract candidates are hired when the demand for qualified teachers increases vastly beyond the feasible supply.<sup>8</sup>

A promising trend appeared when we looked at data on newly recruited teachers in 24 sub-Saharan African countries: There was less variation in their qualifications than among existing teachers in the workforce.<sup>9</sup> Although the definition of “qualified” varied from country to country, this finding at least indicates that newer teachers on balance seemed to be receiving more training.

*Recommendation:* Encourage risk-taking instructional behavior among teaching staff. Ministries of education should support and encourage teachers to adopt new, more-effective teaching approaches to ease the risk of stepping out of *status quo* teaching practices.

### Teacher content-specific knowledge

In the classroom, teachers are tasked with facilitating the transfer of knowledge to students through the use of teaching and learning materials during lessons. This presumes that teachers have enough knowledge of the content that they can successfully explain the material and engage students in the learning process. Logically, two questions emerge: If teachers have strong content knowledge in the subjects they teach, does this influence student learning in this subject? And if the opposite is true, does the teachers’ lack of content knowledge impede student learning?

The Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) has conducted numerous assessments that have yielded rich data on student reading and mathematics performance for the region. A recent review of SACMEQ data found a significant and positive relationship between teacher content knowledge and student performance in seven countries (Botswana, Kenya, Mozambique, Namibia, South Africa, Tanzania, and Uganda) for reading; and in seven countries (Botswana, Kenya, Mozambique, Namibia, South Africa, Tanzania, and Zanzibar) for mathematics. This relationship was particularly strong in South Africa, where a one standard deviation (1.0 SD) increase in teacher content knowledge was associated with increases of 0.38 and 0.43 SD in student assessment performance.<sup>10</sup> Based on this evidence, although teacher content knowledge may not directly affect effective teaching—and to be certain, many environmental factors surely also affect student learning—lack of content knowledge may inhibit teachers’ ability to pass knowledge on to students.

### Conditions of teaching and learning: Classroom context and resources

The conditions of the classroom and school affect not only students’ ability to learn, but also the retention and recruitment of teachers. One commonly discussed and important factor is the pupil-to-teacher ratio (PTR), which influences how easily a teacher can deliver content and quality instruction, as well as provide individualized attention to students or small groups—behaviors known to promote effective learning. Pupil-to-teacher ratios of 40:1 for primary school and 30:1 for secondary are widely recognized in development literature to be the internationally agreed-upon PTR standards. However, as universal primary education has increased in the past decades, in actual practice, this ratio has grown significantly in many countries’ classrooms. Where data were available through the World Bank DataBank,<sup>11</sup> we found that 25 of 38 sub-Saharan African countries had PTRs above the 40:1 standard. Extreme instances of PTRs above 100 were not uncommon in parts of Malawi and Tanzania.

Having more children in the classroom puts extra strain on already limited teaching and learning resources. Among the 33 sub-Saharan African countries with data available through the World Bank DataBank, one-third had pupil-textbook ratios at or above 2:1. Although the data are silent on the quality

<sup>8</sup> Kruijer, H. (2010). *Learning how to teach: The upgrading of unqualified primary teachers in sub-Saharan Africa*. Brussels: International Education.

<sup>9</sup> Nordstrum, L. E. (2015). *Effective teaching and education policy in sub-Saharan Africa: A conceptual study of effective teaching and review of educational policies in 11 sub-Saharan African countries*. Report prepared for the Bureau for Africa, Office for Sustainable Development, Education Division. Research Triangle Park, NC: RTI International. p.21.

<sup>10</sup> Altinok, N. (2013). *The impact of teacher knowledge on student achievement in 14 sub-Saharan African countries*.

Background paper prepared for the EFA Global Monitoring Report 2013/14. Paris: UNESCO.

<sup>11</sup> Data from World Bank DataBank Education Statistics: <http://databank.worldbank.org/data/databases.aspx> (accessed 10/14/2014) Note: Data are from 2012 or latest available.

or effective use of the textbooks, it is clear that in many countries, there is a sharp shortage of textbooks. Six countries had more books than students, which points to an issue of ineffective resource distribution or stockpiling of out-of-date materials. The data collected in Tanzania in 2014 showed that although the majority of students (two-thirds or more) had exercise books on the day of the assessment, 25% of classrooms did not have a Kiswahili textbook, and 20% of classrooms did not have mathematics textbooks.<sup>12</sup> In other countries, textbook and materials distribution is regionally erratic (as in Ethiopia<sup>13</sup>) or virtually nonexistent (as in Rwanda<sup>14</sup>).

Although there are serious shortages of learning materials in many countries, it should be cautioned that mere access to textbooks does not ensure the effective use or quality of textbooks, both of which are equally as important as availability and access.

### Teacher absenteeism, attrition, and retention

In primary schools worldwide, teachers remain central to most functional, effective classrooms. Without them, unsurprisingly, students are less likely to learn. When teachers are habitually absent or when teacher turnover is high, there is a negative effect on student scores.<sup>15</sup> Teachers' absenteeism from the classroom also reduces time on task, which has been shown to impact student academic outcomes. This was found to be the case in Tanzania,<sup>16</sup> Nigeria,<sup>17</sup> and Kenya.<sup>18</sup> Although there are legitimate reasons for teachers to be absent (such as training or illness), high rates of absenteeism prevalent across sub-Saharan Africa contribute to great amounts of lost instructional time.<sup>19</sup>

Teachers leaving the workforce is another element impeding effective teaching practices. A substantial problem for sub-Saharan Africa, teacher attrition may also affect student achievement.<sup>20</sup> Evidence from higher-income countries has indicated that frequent teacher turnover impacts student language arts and mathematics scores and discourages the establishment of trust between students and teachers.<sup>21</sup> As such, ministries of education must find ways to keep and attract teachers. They must also find ways to make the teaching profession attractive to prospective candidates and existing teachers.

*Recommendation:* Reconfigure the school day to allow time and space for teachers to work differently. Teachers must be permitted to adopt and adapt to new instructional behavior norms, and mechanisms for feedback from peers should be encouraged.

<sup>12</sup> See Brombacher et al. (2014).

<sup>13</sup> Piper, B. (2010). *Ethiopia Early Grade Reading Assessment. Data analysis report: Language and early learning*. Prepared for USAID under the EdData II project, Task Order Nos. EHC-E-07-04-00004-00 and AID-663-BC-10-00001 (RTI Tasks 7 and 9). Research Triangle Park, NC: RTI International.

<sup>14</sup> See DeStefano et al. (2012).

<sup>15</sup> Ronfeldt, M., Lankford, L., Loeb, S., & Wyckoff, J. (2011). *How teacher turnover harms student achievement*. National Bureau of Economic Research Working Paper No. 17176. Cambridge, MA: NBER.

<sup>16</sup> See Brombacher et al. (2014).

<sup>17</sup> RTI International. (2013). *Results of the 2013 Early Grade Reading and Early Grade Mathematics Assessments (EGRA and EGMA) in Bauchi State*. Research Triangle Park, NC: RTI International.

<sup>18</sup> See RTI International (2012).

<sup>19</sup> Abadzi, H. (2007). *Absenteeism and beyond: Instructional time loss and consequences*. Policy Research Working Paper No. 4376. Washington, DC: The World Bank.

<sup>20</sup> Boyd, D., H. Lankford, S. Loeb, M. Ronfeldt, and J. Wyckoff. (2010). *The effects of school neighborhoods on teacher career decisions*. Teacher Policy Research Working Paper.

Goldhaber, D., B. Gross, and D. Player. (2007). *Are public schools really losing their "best"? Assessing transitions of teachers and their implications for the quality of the teacher workforce*. Washington, DC: Center for Analysis of Longitudinal Data in Education Research.

<sup>21</sup> See Ronfeldt et al. (2011).

## Teacher remuneration and salary expenditure

The proportion of a country's education budget spent on teacher salaries varies from place to place. The recommended allocation is roughly two-thirds, but in some places, it is as low as 50%, and in others, it is as high as 90% or more.<sup>22</sup> The two-thirds guideline allows sufficient allocation to teacher salaries, as teachers are the central and most expensive education budget line item, yet also ensures that other important expenses, such as teacher support and resources, are not crowded out. On the other hand, if too little is spent on teacher salaries, it is difficult to attract or retain well-qualified, motivated individuals to the profession. Of 26 sub-Saharan African countries with data available through the UNESCO Institute for Statistics, 17 were found to allocate more than two-thirds of their education budgets to education, and 10 allocated more than 75%.<sup>23</sup>

*Recommendation:* Allow experimentation with alternative remuneration schemes. Innovative remuneration schemes could better reflect the role teachers have in fulfilling values held by society through their professional actions, responsibilities, and functions.

In developing countries, salaries tend to be 4.1 times the gross domestic product (GDP) per capita for primary teachers and 6.3 to 7.2 times GDP per capita for secondary teachers. In developed countries, the rate for secondary teacher salaries is lower (1.0–1.5 times GDP per capita).

Incentive schemes have also been trialed in various sub-Saharan African contexts. The idea behind these schemes is to increase teacher pay through monetary reward for excellent teaching or high student achievement scores, and in so doing to incentivize teachers to behave in specified ways or to attempt to raise test scores. According to a joint ILO/UNESCO report,<sup>24</sup> these schemes have had mixed results. For example, some teachers have requested transfers to higher-performing schools, often in situations where the school's performance is because the students are easy to teach, rather than because of the teachers' efforts. Thus, performance schemes can incentivize "cherry picking" and other zero-sum behaviors instead of more effort and professional care.

## Conclusion

Constrained finances, limited availability of high-quality data related to teaching practices, implementation challenges, and system design impediments are four limitations prevalent in sub-Saharan Africa that inhibit positive influences on effective teaching practices. The policy recommendations highlighted in the text boxes highlight specific suggestions of ways to address these constraints while working to encourage actions that will result in improvements in effective teaching.

<sup>22</sup> See Nordstrum (2015), p. 39.

<sup>23</sup> See Nordstrum (2015), pp. 37, 40.

<sup>24</sup> Figazzolo, L. (2012). *Terms and conditions of employment of teachers in relation to teacher shortages and Education for All*. Background paper for the 11st session of the Joint ILO/UNESCO CEART. Geneva: UNESCO and International Labour Organization.

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