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Case Study

Using Opportunity to Learn and Early Grade Reading Fluency to Measure School Effectiveness in Mozambique

Executive Summary

Mozambique is one of the poorest countries in the world, ranking 172 of 182 countries in 2009 (HDI, 2009). More than half of its population lives below the poverty line without access to basic services such as education. More than 40 percent of the state budget still depends on external assistance (MDG Goals, 2010). Cabo Delgado, the northernmost province of Mozambique, has among the highest poverty rates in the country. Sixty-three percent of Cabo Delgado's population lives below the poverty line (the national average is 54 percent). Per capita GDP for Cabo Delgado was just \$170 in 2010 (INE, 2010). Primary net enrollment rates nationwide average 92 percent (UIS, 2010).

School effectiveness is measured and evaluated in terms of both specific student learning outcomes and the opportunity to learn provided by the school. Building on findings from a series of 10 case studies of complementary programs (DeStefano, et al., 2007) as well as research on opportunities to learn (OTL) (Gillies & Quijada, 2007), EQUIP2 identified the following 12 factors as foundational in terms of providing students the basic opportunities needed for learning:

1. Percentage of days school is open
2. Teacher attendance
3. Student attendance
4. Percentage of the school day available for instruction
5. Percentage of student time-on-task
6. Equivalent percentage of days available for instruction (calculated based on factors 1–5)
7. Percentage of students with a textbook
8. Percentage of observed textbook use
9. Percentage of time spent reading
10. Grade 3 reading ability
11. Class size
12. School support

These factors provide a practical framework for assessing whether a school is providing children the maximum opportunity to learn.





The research questions for the study are as follows:

- How well do schools provide an opportunity to learn?
- How does the actual opportunity to learn compare with the potential opportunity to learn?
- How does the opportunity to learn vary across schools?
- Based on the provision of an opportunity to learn, are students in Grade 3 learning to read?

Through collaboration with the Provincial Directorate, and a partnership with the Aga Khan Foundation (AKF), EQUIP2 was provided access to schools in six districts of Cabo Delgado Province: Ibo, Pemba Metuge, Macomia, Meluco, Quissanga, and Mecufi. Over 60 schools were visited during this study and complete data were collected at 49 schools. A total of 631 Grade 3 students were tested for foundational reading skills. Researchers conducted classroom observations in more than 100 Grade 1–3 classrooms.

Findings

Overall, students in Grade 3 are struggling to read. Of the 631 Grade 3 students sampled, 59 percent were unable to read a single word in Portuguese. Approximately 33 percent were only able to read from 1 to 5 words per minute (wpm) and only 6 percent of students in the sample were able to read more than 11 wpm. On average, a greater percentage of boys were able to read and at a faster rate than the girls in the sample.

It is not clear if students in Cabo Delgado understand spoken Portuguese or have the requisite vocabulary base to read. Although 25 percent of the overall sample was able to answer 10 or more of the oral vocabulary questions, the remaining 75 percent of students struggled considerably with the oral vocabulary exam. The average number of correct responses on the oral vocabulary test was 10 of 20 questions with variations in student performance ranging from 0–18 questions answered correctly.

Students in Cabo Delgado struggle with letter recognition, but understand the concepts behind learning the alphabet. Across the sample, Grade 3 students were able to recognize an average of 8 letters correctly in one minute; 14 percent were able to identify 20 or more correct letters. Some students recited the alphabet or gave Arabic letters as responses. Although the behavior did not follow the directions for the assessment, it did demonstrate that a group of students understood the idea behind the identification of letters but simply lacked the skills to complete the exercise.

Students in Cabo Delgado are gaining knowledge of concepts about print, but slowly. On average, Grade 3 students in the study sample were able to answer 4 out of 10 questions related to understanding concepts about print material. Over 70 percent of students were able to identify the cover of the book and open to the page where the story began, but struggled when asked to follow along as the enumerator read and to select a word from the text and read it aloud. There was a great deal of variation in

student scores ranging from 0–10 responses answered correctly. These results suggest that students are developing some fundamental pre-reading skills but struggle when asked to perform at a higher level.

Students' mother tongue is an important factor to consider in the reading assessment results. Ninety-three percent of students in the sample reported speaking one or more mother tongue languages at home. On average, students speaking only ShiMakonde, Emakhuwa or KiMuani at home had very similar scores on each of the tests and struggle the most to read. Students who spoke more than one mother tongue language at home scored slightly higher than those speaking only one language. For example, students in the multiple mother tongue groups read on average 13 letters and eight words per minute (wpm). Students who speak only one mother tongue read seven to eight letters and only two wpm. Results were much higher for students who spoke Portuguese at home; these students scored an average of 18 of 20 on the oral vocabulary and identified 25 letters of the alphabet. Students who speak Portuguese plus another mother tongue language scored 12 on the oral vocabulary; identified 38 letters of the alphabet correctly; and read an average of 25 wpm. Sample schools in Macomia had the lowest percentage of non-readers (57%).

At a minimum, all students need books, reading and writing materials, as well as focused time for reading to develop foundational reading skills. The majority of students in Grades 1–3 had language textbooks (80 percent). Nearly 32 percent of students in the sample did not have notebooks and 27 percent of students did not have writing utensils. Students in Grade 3 were less likely to have textbooks compared to Grades 1 and 2 (63 percent compared to 79 percent and 80 percent respectively). Time dedicated to using the printed materials is also important; although over 80 percent of students in the sample had a textbook, the books were only used 40 percent of the time or less in Portuguese classes.

In addition to the lack of foundational reading skills, several other factors were found that influence the quality and opportunity to learn provided by schools in Cabo Delgado:

- The school year in Mozambique officially runs from January to October and includes 183 days. Schools in this study opened, on average, 4 days after the official start date and had been closed an average of 6 days by the time of the school visits in May 2010, with a variance of 0–60 days reported among the sample of 49 schools.
- The average teacher attendance rate according to official documentation from the sample schools was 87 percent, but observed attendance rates were much lower, suggesting that actual rates are likely lower than reported. Teachers reported missing an average of 21 teaching days from the start of the school year to May 2010, with a variance among schools of 5–92 days.
- The average student attendance rate was 78 percent, equivalent to a loss of 32 school days a year (nearly two months). Schools reported a range of attendance rates, from a low of 39 percent to a high of 98 percent.

- Students are losing more than 50 percent of potential learning time as a result of late start times, early closing, and extended recesses.
- When teachers are engaged in academic activities (on task), Grade 1–3 students spent 75 percent of the time on task. In comparison, when teachers were off task, students only spent 21 percent of the time engaged in academic activities.

When all the opportunity to learn (OTL) factors are accounted for, only 30 days a year remain for actual instruction to take place compared to the expected 183 days mandated by the Ministry of Education.

Policy Implications

Improve the school schedule

When addressing time variables, the implications for policy reform need to distinguish between factors that are easily addressed and those that require more complicated policy interventions. OTL factors such as school closures, absenteeism, and daily time losses are more easily corrected than ensuring quality time-on-task, teacher training, and support services, because policy-makers can engage communities in solving the former set of problems and holding schools accountable. EQUIP2 complementary education research supports the idea that community-run or supported programs are designed to engage parents help to ensure that schools are open, and teachers and students are present.

Provision and use of reading materials and textbooks:

- Textbooks are not a useful tool unless teachers have training on how to integrate the books into their instructional practice. Training to effectively use textbooks should include pedagogically sound approaches such as including activities that emphasize the development of phonological awareness skills, silent reading of story books, and peer reading.
- Government textbooks and other supplemental books, such as storybooks, should include stories and texts that allow students to practice reading. Examples of texts that children could read (such as storybooks) were limited and failed to engage children's imaginations and excite them about learning to read. Practice reading is critical for early grade students to learn to read. The government should consider strengthening efforts to introduce more reading instruction in mother tongue languages and to evaluate, strengthen, and possibly expand the bilingual education program that is currently implemented on a small scale.
- Classroom practices must include use of textbooks and other reading materials to improve learning and to engage students. Teachers need to apply these strategies consistently in the classroom. The implication for policy-makers is twofold. First, classrooms must be equipped with additional materials such as easels, storybooks, and supplies for students to create and use reading materials. Second, the link between providing these new materials to pre-service and in-service teacher training and support must be clear to ensure the materials are used in ways that help students learn to read. In this lies a more complex set of investments with unclear financial

trade-offs that should be carefully examined in each context.

- Introduce interventions such as accelerated learning programs, after-school tutoring, and special classes for students who are behind. Implementing community and/or school libraries would also provide students and families the opportunity to interact with more print material and extend learning past the classroom.

The OTL index developed under EQUIP2 includes reading fluency as an indicator of school effectiveness. This index provides a tool that could be used to contextualize the information about learning outcomes provided by Early Grade Reading Assessments (EGRA). The OTL index provides educators, program managers, and policy-makers with useful, time-relevant data about variations among schools across the 12 factors. These school effectiveness data can allow more targeted support where assistance is needed. For example, one school may have high time-on-task percentages, but high teacher absentee rates. This knowledge could help a community or education official focus on the specific issue at the school, in this case determining why teachers are consistently absent. The OTL index would allow individualized and on-going support to schools by allowing supervisors to collect school-relevant data.

In addition, the successful implementation of EGRA in this study demonstrates that literacy assessments in general can be designed to serve as useful diagnostic tools in a variety of settings and languages. Such assessments—once adapted to the local context—need to be used more systematically, not only to gauge whether learning is occurring, but also to allow teachers to spot check their students' progress. Literacy assessment tools such as EGRA can help teachers deploy instructional interventions that respond to their students' needs, including identifying students who need significant remedial support.

Conclusion

Although national and international organizations and governments working in education may strive towards the same outcome of improving student learning, not every agency targets the same inputs to reach this goal. In this study, we argue that to improve student learning, we must first guarantee that children are provided the basic opportunities to learn. Ensuring that schools are open and that teachers and students are present will ensure there is more time available for instruction. But providing time is not enough. There needs to be an increased focus on building foundational skills in reading. Teaching students to unlock the meaning of text is the single most powerful skill teachers can foster (Lemov, 2010). To help early grade students improve their reading, teachers need to dedicate more classroom time to teaching skills such as decoding, fluency, vocabulary, and comprehension and provide sufficient time for individual, small group, and/or shared practice around reading. Parents are also essential elements in supporting students to become successful learners and can serve as valuable resources both inside and outside the classroom. By reaching out to parents and the broader community, schools can extend their educational reach and expand the space for learning past its walls.



Introduction

Mozambique is one of the poorest countries in the world, ranking 172 of 182 countries in 2009 (HDI, 2009). More than half of its population lives below the poverty line without access to basic services such as education. More than 40 percent of the state budget still depends on external assistance (Republic of Mozambique, 2010). Cabo Delgado, the northernmost province of Mozambique, has among the highest poverty rates in the country. Sixty-three percent of Cabo Delgado's population of 1.6 million lives below the poverty line (the national average is 54 percent). Per capita GDP for Cabo Delgado was just \$141 (half the national average) in 2002, well below the UNDP extreme poverty line of \$1 per day (Bechtel, 2003). Despite some areas of economic growth in the province, the majority of the population in Cabo Delgado live in isolated villages, with poor access to year-round passable roads and corresponding poor access to markets, education and health services, and power and communication infrastructure.

In 2010, the USAID-funded EQUIP2 project teamed with the Aga Khan Foundation (AKF) to examine the effectiveness of primary schools in terms of time spent on and off task and children's ability to read in Grade 3. In this study, school effectiveness is measured and evaluated in terms of both specific student learning outcomes and the opportunity to learn provided by the school.

Building on findings from a series of ten case studies of complementary programs (DeStefano, et al., 2007) as well as research on the opportunity to learn (Gillies & Quijada, 2007), EQUIP2 identified the following 12 factors as necessary to establish a foundational opportunity to learn:

1. Percentage of days school is open
2. Teacher attendance
3. Student attendance
4. Percentage of the school day available for instruction
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6. Equivalent percentage of days available for instruction (calculated based on factors 1–5)
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8. Percentage of observed textbook use
9. Percentage of time spent reading
10. Grade 3 reading ability
11. Class size
12. School support

These factors provide a practical framework for assessing whether a school is providing children with the maximum opportunities to learn and whether it draws on teaching approaches that make the best possible use of the instructional time that is available. The research questions for the study are as follows:

- How well do schools provide an opportunity to learn?
- How does the actual opportunity to learn compare to the potential opportunity to learn?
- How does the opportunity to learn vary across schools?
- Based on the provision of an opportunity to learn, are students in Grade 3 learning to read?

Through collaboration with the Provincial Directorate, and in partnership with AKF, EQUIP2 was given access to schools in six districts of the Cabo Delgado Province: Ibo, Pemba Metuge, Macomia, Meluco, Quissanga and Mecufi. Over 60 schools were visited during this study and complete data were collected at 49 locations. The data from this study will be used by AKF who, in collaboration with the Provincial Directorate, district education departments, communities, and schools, will modify their current interventions with the aim that collectively all stakeholders involved can improve the opportunity to learn that schools provide their students.

Context

Education opportunities in Cabo Delgado over the past 10 years have been largely influenced by the Government of Mozambique’s Education for All efforts. The government removed enrollment fees in primary education, provided free textbooks to students, introduced a new curriculum, removed exams between primary education grades, promoted accelerated construction of schools, built teacher training institutes in each province, and increased the number of trained teachers. Despite these reforms, Mozambique continues to trail behind other African countries in its major education indicators. Table I summarizes the main education indicators in Mozambique and more specifically, in the province of Cabo Delgado.

Table I: Select education indicators

	Country	Cabo Delgado
Adult female literacy rate (MICS 2008)	47%	29%
Adult illiteracy rate (World Bank 2003)	54%	68%
% of secondary school age girls attending secondary school (MICS 2008)	20%	11%
% of primary school age girls attending school (MICS 2008)	80%	74%
Primary school net enrollment rate (MICS 2008)	82%	74%
Primary school net completion rate (MICS 2008) ¹	15%	9%
Grade 1–5 teacher:student ratio (MOE 2004)	66:1	75:1
Proportion of female teachers, Grade 1–5 (MOE 2004)	29%	12%



The existing primary education system includes the following categories: *Escola Primaria do I Grau* (EP1) referring to Grades 1–5; *Escola Primaria do II Grau* (EP2) referring to Grades 6–7; and *Escolas Primarias Completas* (EPC) referring to schools with Grades 1–7. More than 70 percent of primary schools in Cabo Delgado accommodate two shifts a day (and sometimes up to three in urban areas), resulting in an increased workload for teachers and a shortened school day for students.

The number of EP1 students in Cabo Delgado increased from 224,000 to 312,000 from 2003 to 2008 (Bechtel, 2003). However, the province has the lowest EP1 completion rates in the country (62.1 percent); the lowest EP2 net completion rates (8.8 percent); and one of the highest EP1 teacher student ratios (75:1) in Mozambique (Republic of Mozambique, 2010). In Pemba, the provincial capital, 12 of its 14 primary schools are EPC schools. In stark contrast, only 41 of the 151 (27 percent) primary schools located in the 5 districts where AKF (Mozambique) worked at the time of the study were EPCs. Opportunities for children to complete seven years of full primary schooling are severely limited.

Mother tongue instruction is an important factor in Mozambican education. Nationally 6 percent of the population speaks Portuguese as a first language and an additional 39 percent speak Portuguese as a second language (Patel, Chambo & Tempe, 2010). Bilingual instruction was introduced in 2001 and the *Instituto Nacional de Estatisticas* (INDE) has adopted an official bilingual program in its education system; however, by 2008 of the 11,859 schools, only 75 were bilingual (Patel, Chambo & Tempe, 2010). The current *Plano Curricular do Ensino Básico* (PCEB, Basic Education Curriculum Plan) suggests that pedagogically the ideal model is bilingual education in which initial learning (reading and writing) would be in the child's mother tongue. Although the Ministry of Education is moving toward this approach, teachers are expected to use 'on-the-spot' translation to assist students to learn Portuguese. The languages most commonly spoken in Cabo Delgado are Emakhuwa (67 percent), ShiMakonde (20 percent) and KiMwani (6 percent), and in the first years of school, students are expected to learn to speak, read, and write in what for most is an entirely new language (Portuguese).

The Aga Khan Foundation and Education in Cabo Delgado

Aga Khan Foundation (Mozambique) (AKF(Moz)) has been operating in Cabo Delgado since 2001. AKF's multi-sectoral program (Coastal Rural Support Programme) combines interventions in education, health, civil society, enterprise and rural development, and the built environment to address development priorities that include poverty reduction, food security, and improved quality of life. AKF(Moz) actively promotes partnerships between the government, private sector actors, and civil society institutions. AKF (Moz)'s education interventions began with adult literacy programs in 2003, and more broadly work with local communities and the Government to understand and begin to improve access to and quality of educational opportunities available in Cabo Delgado.

Currently, the foundation's education program in Cabo Delgado supports early childhood development (ECD), adult literacy, school improvement, and access to technical and tertiary education through scholarships.

At the primary level, the School Improvement Program (SIP) has followed a complementary approach to government actions providing technical, material, and financial support for planned in-service training for existing teachers, scholarships for new teachers (over 60), assisting with the orientation of teachers to the new curriculum, distribution of teaching and learning materials, training community school councils, and supporting school and latrine construction. Since 2004, and beginning in two districts, AKF's SIP has been concerned with improving children's timely enrollment (closer to the expected age 6 rather than 8 or older as is common), creating opportunities for additional learning outside school hours, and increasing family and community involvement in children's education.

The AKF education team has to date been limited in size (one to two SIP staff in Pemba working with usually one education person based in each of the five districts). This structure, where AKF staff are informed through ongoing dialogue with communities and provincial education authorities, has enabled AKF to support parents and community members to contribute directly to improving their children's education on the one hand and school directors and district staff on the other to reach teachers rather than the AKF education team themselves providing separate professional development and in-class coaching. In addition to supporting primary education, AKF has supported the development of 58 community libraries linked with the adult literacy initiatives and is piloting 14 'community learning spaces' (espaços comunitários de aprendizagem—ECAs) that are operated by communities in the targeted districts and provide primary students with opportunities to practice writing and access reading materials. The ECAs aim to allow students to get support on school matters from volunteer 'Friends of School' who are largely local community resource persons.

Table II provides primary school enrollment data for the schools situated in AKF (Moz)'s target area in 2009. In 2009 there were 151 primary schools across the five districts in which AKF was working with government and communities, reaching more than 43,000 students.

To provide AKF (Moz) with relevant comparison data, the study was also conducted in the neighboring district of Mecufi. In 2009, there were 19 schools in Mecufi—14 EP1 schools and 5 EPC schools—with a combined student population of 9,484 students in Grades 1–7.



Table II: AKF supported schools in target areas

	Ibo	Pemba Metuge	Macomia	Meluco	Quissanga	Total
Year AKF began working in district/schools	2004	2007	2007	2008	2004	
Number of EP1 schools	7	18	37	20	28	110
Number of EPC schools	3	10	10	9	9	41
Total number of schools:	10	28	47	29	37	151
Total enrollment: Grades 1–5 (% girls)	2,062 (53%)	12,048 (47%)	15,442 (47%)	4,787 (46%)	9,504 (46%)	43,843 (48%)
Total enrollment: Grades 6–7 (% girls)	376 (53%)	1,611 (44%)	1,916 (36%)	822 (30%)	803 (32%)	5,528 (39%)

DPEC data 2009

Study Sample and Methodology

Based on mutual interest to understand what interventions best support student success in schools, EQUIP2 partnered with the Aga Khan Foundation (AKF) to conduct this case study. AKF provided a co-investigator, facilitated access to schools in the districts where AKF is implementing activities, and provided field support from their offices for data collection, transportation, and materials. The following discussion elaborates on the sampling and methodology used for collecting and analyzing the data presented in the case study. The results represent the establishment of a baseline of time lost by students, instructional time on task, and student reading fluency in a sample of government schools in six districts of Cabo Delgado. The purpose of the study is to assist AKF to refine their interventions to better assist teachers and students in the classroom and was not an evaluation of AKF’s performance.

Study Sample

At the time of the study, AKF supported 151 schools in five districts in Cabo Delgado. The research team stratified the 151 schools by distance and size of school and then randomly selected 52 (34 percent of the total) schools, which were proportionately distributed between size and distance categories. Researchers also selected 10 matching comparison schools, which were chosen based on a similar socio-economic status of the families, distance, and size of school.

The district and provincial government offices provided access to the selected schools. The team made 70 school visits, returning twice to any school that was closed the first time. On 19 occasions (27 percent of the time) the visited school was found to be unexpectedly closed. Data collection did not occur in a number of schools because some schools were found closed during the second visit or students from Grade 3 were not present on the day of the visit. Of the total original sample of 62 schools, researchers were able to collect complete data from 49 schools (44 in the AKF program area and 5 comparison schools). Schools often divided the grades between a morning and afternoon shift. In general the research team arrived at the schools in the morning and would stay for the second shift if it included Grade 3 students. Given the small sample size of comparison schools where data could be collected and similarity found within the data, the two groups were combined for this study and the findings will be presented together.

The characteristics of the final sample of 49 schools are summarized in Table III by district.

Table III: Characteristics of schools in the sample

	Number of Schools	Total Grades 1–3 Enrollment	Total Grade 3 Enrollment	Average Grade 3 class size
Ibo	3	553	184	46
Pemba Metuge	7	1,720	419	38
Macomia	18	3,960	1,187	47
Meluco	6	773	193	32
Quissanga	10	2,115	519	40
Mecufi	5	1,645	441	44
Total	49	10,766	2,943	45

The research team interviewed a total of 631 Grade 3 students (50 percent girls) in 49 schools. In each of the schools, the research team randomly selected 20 Grade 3 students to participate in a series of early grade reading assessments (EGRA). The number of boys and girls in the sample was selected to match the gender ratio in the classroom. When researchers found fewer than 20 students in a classroom (e.g., due to absenteeism or small class size) all of Grade 3 students were assessed. On a number of occasions, the school day would end prematurely and enumerators were unable to interview the entire sample of students. The research team was able to interview an average of 13 students per visit but the range in the number of interviews conducted at each school went from as few as 4 to as many as 23. Classroom observations were conducted in over 100 Grade 1-3 classrooms. Table IV provides a summary of the characteristics of the students included in the sample as reported by the students.



Table IV: Characteristics of students in the sample

	Total Sample
Number of Grade 3 students sampled	631
% Boys	50%
% Girls	50%
Average age (years)	11
Range in age (years)	5–18
% over age (older than 8 years)	89%
% who attended preschool	13%
% students who did not repeat Grade 3	88%
% student who did not repeat any grade	52%
% student who walk less than 10 min. to school	25%
% students who walk 10 to 30 min. to school	68%
% students who walk more than 30 min. to access water	27%
% students who work outside their home	21%
% students who have in their home:	
a radio	67%
a bicycle	57%
a toilet	48%
a mattress	34%
a refrigerator	3%
access to electricity	3%
% students who read independently at home	24%
% students who have someone to read to them	28%
% students with at least one book at home	33%

As the table demonstrates, the sample was divided equally between male and female students. The average age of students was 11 and 89 percent of students in Grade 3 were over age. Although the majority of the sample was over the target age for Grade 3 (8 years old), only half of the students reported having repeated a grade.

In terms of household characteristics, the most common possession was a radio and almost half of the families had a toilet. However, only 3 percent of the students’ homes had electricity or a refrigerator. Approximately 21 percent of students in the sample worked outside the home mainly selling different goods or produce while others reported working in the fields or washing clothes. Sixty-eight percent of students walk

between 10 and 30 minutes to school each day while only 25 percent of students walk less than 10 minutes to get to school.

When asked about their own reading habits, 24 percent of children reported they read at home and 28 percent said that someone at home reads to them and only 33 percent of students had a book at home.

When asked about the education level of their parents, students in the sample schools reported the following:

- Forty-one percent of children did not know the education level of their mother and 54 percent did not know the education level of their father.
- For those children that did know:
 - 48 percent reported that their mother had no education.
 - 46 percent reported that their mother had finished primary school.
 - 38 percent reported that their father had no education.
 - 50 percent reported that their father had finished primary school.

Of the characteristics described above, both gender and age were strongly associated with students' reading outcomes. Boys tended to display greater rates in fluency than girls and older students could also read at a faster speed. Students who reported reading at home also had on average a higher reading rate relative to the others. Interestingly, there was no relationship between the number of books students reported having at home and reading fluency. Similarly, students who reported having someone at home to read to them did not score on average higher than those who did not have such support. There was no difference in reading scores when results were disaggregated according to socio-economic indicators. Greater analysis of the differences in literacy skills will be provided in later sections.

Data Collection Methodology

The protocols for this research were adapted from instruments used in EQUIP2 Opportunity to Learn studies in Latin America and elsewhere in Africa. The instruments were carefully modified with the support from the local AKF team to be appropriate for Mozambique and specifically the province of Cabo Delgado. All instruments were translated into Portuguese, piloted in-country and revised accordingly. The following protocols were used in the study:

- **Stallings Observation Instrument:** The Stallings Observation Instrument is a classroom snapshot that records what academic and non-academic activities teachers and students are engaged in and the materials being used in a classroom.
- **Interview Protocols:** A teacher and school director interview protocol were developed and used to collect data on teacher and student absenteeism as well as school support services. A student protocol was also included to gather information on family socioeconomic background, language use, and reading habits.
- **School Observation Instrument:** A school observation instrument was developed to

document environmental data, and in particular, the actual and observed timings for school opening, recess, and closure.

- **Reading Assessments:** Five EGRA assessments were adapted for use in the Grade 3 reading assessments, including oral vocabulary, letters, concepts about print, reading fluency, and reading comprehension. These instruments were originally developed by RTI under the USAID-funded Ed Data II project and adapted for use in Mozambique.²

The EQUIP2 research team spent one day visiting each school. Each visit consisted of six activities:

- Capture general observations about the school, including the presence of certain facilities and whether students and teachers were inside or outside the classroom.
- Observations in Grades 1, 2, and 3 for 45 minutes each using the Stallings Observation Instrument.
- Interview the school director to obtain information on student enrollment, teacher and student attendance, teachers background data, support visits received by the school and community participation at the school level.
- Interview each of the teachers observed to gather information on background, experience, attendance, classroom support and reading instruction.
- Interview individual students in Grade 3 to obtain information on the students' background, language use, and reading habits.
- Conduct an oral vocabulary exam and three reading assessments to measure print awareness and basic literacy skills of Grade 3 students.

The EQUIP2 team trained local data collectors to use the instruments to collect all data during the school visits. Data collectors were assigned to teams based on their knowledge of and fluency in the mother tongue spoken in the given districts. Interviews with students to gather data on socioeconomic (SES) factors and students' academic engagement in the home as well as the Concepts about Print (CAP) assessment were conducted in the child's mother tongue. All other student assessments were conducted in Portuguese, the language in which children are taught to read; however, the directions given to the student for each assessment were stated in the child's mother tongue.

Data collected from the schools was entered into Excel and then uploaded into SPSS for analysis.

Limitations of the study

Although the data presented in this study are robust and representative of education in these schools, there are important limitations to the methodology and data that must be recognized:

- Since only schools in a limited portion of the Cabo Delgado province were visited, the data cannot be used to make larger assumptions about schools across Mozam-

bique. The results offer insights into the situation of education in rural Mozambique, however, and offer a framework for developing further research in this area of the country.

- The research team was only able to gather complete data from 49 schools compared to the intended 62 from the initial sample.
- Because the number of schools is small, this study presents descriptive statistics and analyzes simple relationships among the different variables measured using two-tailed t-tests with ≤ 0.05 .
- Although efforts were made to create a positive interaction with the children, students' performance on the reading assessments may have been negatively affected by their unfamiliarity with one-on-one interviews or the EGRA methodology.
- Data on student age, time to travel to school and their parents' education was self-reported. The data cannot be triangulated with any other source and likely includes some errors. In particular, students were unsure of their age and over half of the group reported they did not know their parents' level of education.
- Data for school closings and student and teacher attendance were taken from attendance books and triangulated with self-reported information. The research team noted that there was a lack of consistency in terms of how the school gathered and recorded absenteeism and school closure data. Attendance data for a given week or month was often filled in to attendance books before the time period had actually passed. In addition, dates of attendance did not always correspond to the actual school calendar. Students or teachers were often marked as present on national holidays when the school should have been, and most likely was, closed. In this study, data that were documented in record books were used whenever possible. For schools without documented data, self-reported data were used and as a last resort, district averages were used when no information was available. Given what was actually observed on the day of the visit, it is most likely the data presented here underestimate the actual absenteeism and school closing rates, especially in terms of student attendance rates, since very limited information was available.

Although the conclusions presented in this report are limited to 49 schools, the findings still shed light on weaknesses with the rural education sector and highlight areas that the Ministry of Education in Mozambique pay particular attention to for strengthening its education system.

Findings

Factors that have an impact on students' abilities to learn to read

Learning how to read is perhaps one of the most critical outcomes of primary education. Studies in the United States have shown that students who have not developed at least a moderate level of literacy skills by the end of Grade 3 are unlikely to graduate from high school (Annie E Casey Foundation, 2010). In Mozambique—where only 54 percent of students who enter Grade 1 graduate from Grade 5—the development of literacy skills in the early grades, among other factors, could positively impact the possibility of a

student completing primary school (UIS, 2010). Furthermore, if children are not going to make it past Grade 5, it is essential that at minimum students have the basic reading skills they will need for the rest of their adult life.

The data gathered from Grade 3 students in this research study demonstrate a strong relationship among each component of the EGRA: oral vocabulary, letter recognition, concepts about print, and reading fluency. Students who scored higher on the oral vocabulary, letter recognition, and CAP assessments were more likely to read at a faster rate. The numbers also clearly show that students in the Cabo Delgado region are struggling to read. Figure I shows the results of the student reading fluency diagnostic by words read per minute in Portuguese for the entire sample.

Grade 3 reading ability

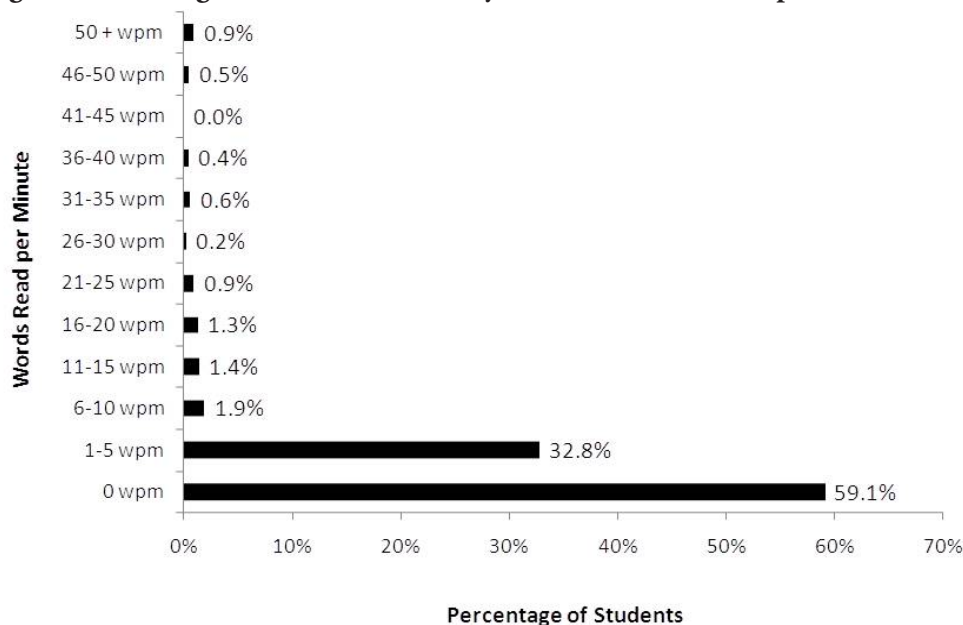
Overall, 59 percent of the sample was unable to read a single word in Portuguese. Approximately 33 percent of students were able to read from one to five wpm and 6 percent of students in the sample were able to read more than 11 wpm. According to research conducted by Helen Abadzi, students learning the Romance-based languages should be able to read 80–90 wpm by Grade 3 and to comprehend the text they were given, students need to be able to read at least 40–60 wpm.³ In this sample, less than 2 percent of students read at least 40 wpm. On average, boys were more likely to be able to read at least one word more than girls (43 percent of boys versus 37 percent of girls). The boys who could read performed at a faster rate (8 wpm) when compared to girls who could read (3 wpm). When comparing students within and across schools, there is very little variation in outcomes.

Research on early grade reading shows that students need to understand spoken language, read letters, and understand concepts about print as foundational skills for learning to read. The following results help us to understand why students in Cabo Delgado are struggling to read.

Portuguese oral comprehension

Oral vocabulary is a key element to learning to read and the relationship between oral vocabulary and reading is among the oldest and most clearly articulated findings in educational research (Blachowicz & Fisher, 1996; Snow, Burns, and Griffin 1998; Stahl, 1999). In addition to oral vocabulary skills, students have to develop alphabetic principles and an awareness of print concepts in order to begin decoding and understanding text. If a child comes to school with an underdeveloped oral vocabulary, it is essential that classroom time is dedicated to helping resolve this deficiency (Foundations for Learning to Read, eduplace.com).

Figure I. Percentage of Grade 3 students by number of words read per minute



Although many factors can explain students’ inability to perform well on the oral Portuguese vocabulary assessment, classroom observations and data collected on students’ mother tongue indicate that many students in Grade 3 were receiving very little exposure to Portuguese. If students miss school often, where they are taught in Portuguese, and do not speak the language at home, it would be very difficult for them to develop a mastery of the Portuguese language. To assess whether students in the sample had developed a basic oral vocabulary in Portuguese, they were asked to identify body parts and everyday objects (e.g., eyes, head, pencil, stone) and to complete a number of basic instructions using common prepositions (e.g., put the pencil on the paper). Only 25 percent of the overall sample was able to answer 10 or more of the 20 oral vocabulary questions. The remaining 75 percent of students struggled considerably with the oral vocabulary exam. The average number of correct responses on the oral vocabulary test was 10 of the 20 questions with variations in student performance ranging from 0–18 questions answered correctly. Students struggled the most with questions related to prepositions, answering an average of one question correctly out of six compared to questions on objects such as pencils and paper, where the average correct response was four out of six. As with the reading fluency assessments, boys outperformed girls on the preposition portion of the oral vocabulary assessment, but just slightly. Boys answered an average of 2.1 questions correctly compared to the average of 1.7 for girls. Variation of students’ scores on the preposition portion of the assessment at the individual level was large, ranging from 0–6 questions answered correctly.

As Table V demonstrates, there was almost no difference in the results among students who reported speaking one of the three mother tongue languages. However, the small sample of students that reported speaking Portuguese and/or more than one mother



tongue language scored higher than those speaking only Emakhuwa, KiMwani, or ShiMakonde. These results were consistent across schools and districts.

Table V: Average oral Portuguese comprehension by students’ reported mother tongue language

Language	N	Body Parts/8	Objects/6	Prepositions/6	Total Average /20	Individual Range
Portuguese	2	6	6	6	18	17–18
ShiMakonde	70	2	3	1	6	0–16
Emakhuwa	392	2	4	1	7	0–18
KiMwani	152	2	4	1	7	0–18
Multiple MT	11	2	4	3	9	2–16
Portuguese +MT	4	3	5	4	12	4–17
Sample Average	631	3	4	3	10	0–18

Letter recognition

Knowing letter names often serves as a ‘marker’ for more complex skills in the ‘learn to read’ process (Foundations for Learning to Read, eduplace.com). Although knowing letters does not have a causal relationship to reading, research shows that it does signal a sensitivity to oral language patterns, concepts about print, and a motivation to learn to read. A child’s recognition and knowledge of letters is a good predictor of learning to read (Chall, 1967; Anderson, et al., 1985; and Snow, Burns & Griffin, 1998).

In terms of students’ ability to recognize letters, across the sample, students in Grade 3 were able to recognize an average of 8 letters correctly in a minute with 14 percent of students able to identify 20 or more correct letters in the same period of time. Forty-three percent of the sample was unable to read a single letter. Although students were asked to read the letters in the order that they appeared on the page, students would often look for letters that they recognized, such as ‘A’, and identify those letters throughout the page. Some students would also recite the alphabet or name any letter they thought of (sometimes in a different language such as Arabic). While the behavior did not follow the directions for the assessment, it did demonstrate that a group of students understood the idea behind the identification of letters but simply lacked the skills to complete the exercise.

Concepts About Print (CAP)

Adams (1990) states that, “children’s performance on tests designed to measure print awareness is found to predict future reading achievement and to be strongly correlated with other, more traditional measures of reading readiness and achievement.” On average, students in Grade 3 were able to answer 5 of 10 questions correctly when it came to knowledge of CAP. Over 70 percent of students were able to identify the cover of the book and open to the page where the story began, but struggled when asked

to follow along as the enumerator read and to select a word from the text and read it aloud. These results suggest that students are developing some fundamental pre-reading skills, but when asked to perform at a higher level (such as follow along in the text or read a word) children were often unable to complete the task successfully. Results at the individual student level varied considerably, ranging from 0 to 10.

As Table VI demonstrates, there was little variation across districts on the average CAP score and variations at the student level were also similar across districts. Macomia performed the best on the CAP assessment in relation to the number of students in the sample from that district.

Table VI: Concepts About Print (CAP) by district

District	N	Average CAP Score	Variation in student scores (CAP)
Ibo	45	4	0–10
Pemba Metuge	115	3	0–9
Macomia	245	5	0–10
Meluco	100	5	0–9
Quissanga	86	5	1–10
Mecufi	40	5	1–7
Sample average	631	5	0–10

Research from studies cited in this section indicates that a strong foundation in oral vocabulary, letter recognition, and CAP facilitates and strengthens students’ ability to read. Table VII illustrates this and results were strongly correlated with performance on the reading fluency diagnostic.

Table VII: Vocabulary, letter, and CAP scores by level of reading fluency (words per minute)

	0 wpm	1-10 wpm	11-40 wpm	41+ wpm
N	377	219	27	8
Average # vocabulary words identified correctly/20	6	7	12	12
Average # of letters identified correctly/min	3	8	56	81
Average # of correct CAP questions/10	4	5	8	7

Students who read over 40 wpm correctly were able to read an average of 81 letters correctly in one minute, respond correctly to 12 of 20 oral vocabulary questions, and answer 7 of 10 CAP correctly. In comparison, students who were unable to read any words on average were only able to read three letters correctly per minute, identify six of 20 Portuguese vocabulary words, and answer 4 of 10 questions on the CAP assessment.

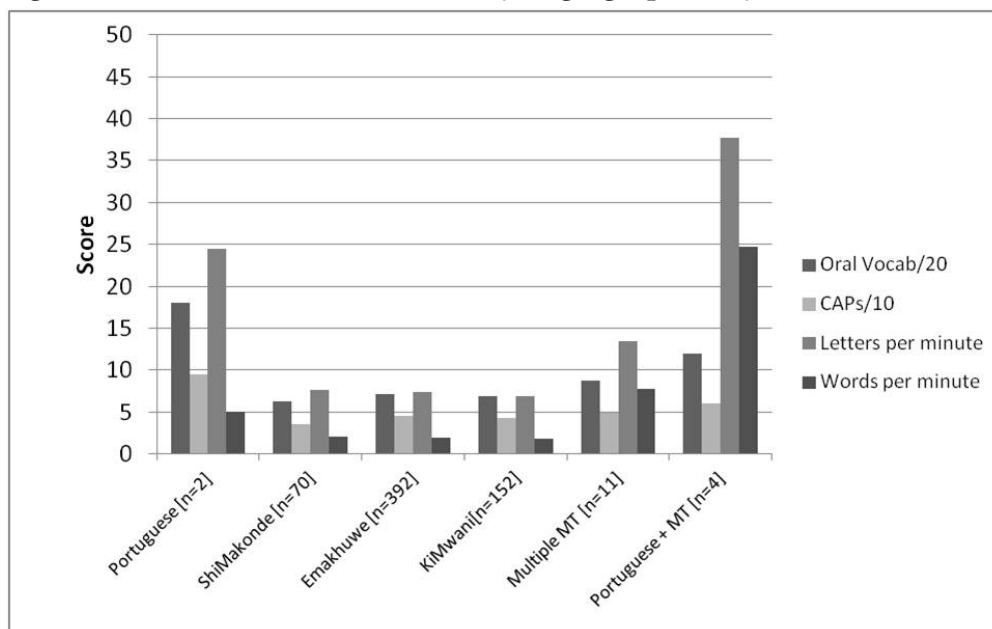
Reading fluency was also positively correlated with age, SES variables, and students' reporting reading at home and was negatively correlated with gender ($p < 0.01$). Older male students who reported reading at home tended to score higher on all assessments. Repetition and reported working outside the home were not correlated to assessment scores.

For those students who could read at least 11 words in one minute, 74 percent were boys with an average reported age of 13 (5 years older than the expected age of a Grade 3 student). Seventy-one percent of these students were from the district of Macomia, although they were spread out across 10 different schools.⁴ Proportionate to the total number of students in the sample from each district, Macomia still had the greatest number of students reading 11 wpm and above. Ten percent of the total population of students from Macomia could read at this rate as compared to 5 percent from Quissanga, 3 percent from Meluco, 2 percent from Pemba Metuge and Ibo, and 0 percent from Mecufi. Forty-seven percent of students reading at this rate also reported that they read at home and 26 percent have someone who reads to them.

Mother tongue and language of instruction

The majority of the students in the sample reported speaking one or more mother tongue languages at home. In Mozambique, less than 6 percent of the population speaks Portuguese as their first language. In the study sample, only six students reported that they spoke Portuguese at home, four of whom also spoke a mother tongue language with their families. Although the sample size is too limited to draw generalizations across the population, it is interesting to look at the results of the reading assessments by language. There is a pattern similar to what was seen in the results from the oral language assessment. On average, students speaking only Emakhuwa, ShiMakonde, or KiMwani at home struggle the most to read, as demonstrated by a very low average test score for each language group. However, as was seen with the oral vocabulary results, also documented here, students that spoke more than one mother tongue language at home scored slightly higher than those speaking only one language. For example, students in the multiple mother tongue groups read on average 13 letters and eight wpm. Students speaking only one mother tongue language read seven to eight letters and only two wpm.

Figure II: Results on EGRA assessments by language spoken by students



As Figure II demonstrates, on average students who reported Portuguese as one of the languages used at home did considerably better on the oral vocabulary (18 of 20 correct) and letter assessments (25) and scored 10 out of 10 on the CAP assessment. However they did surprisingly poorly on the fluency assessment (5 wpm). In comparison, students speaking Portuguese plus one mother tongue language scored only slightly lower on the CAP assessment as other mother tongue-only speakers (6 out of 10) but much higher on the fluency assessment (25 wpm). In the first years of school, students are expected to both learn an entirely new language (Portuguese) and acquire all of the building blocks and basic skills essential to becoming successful learners throughout their education. These results demonstrate that students in the early grades are not developing the needed foundation reading skills in Portuguese.

Although the official language policy in Mozambique is to train teachers to teach in Portuguese and provide spot translation when necessary, Grade 1–3 classroom observations noted that Portuguese was used on average 93 percent of the time. The only area with a noticeable difference was Ibo where teachers were observed using the mother tongue language 57 percent of the time of the classroom observation. In other words, teachers in Ibo were observed giving lessons or conversing with students in the mother tongue language for over half of the class period. In 2008, there were 11,380 primary schools in Mozambique, of which 75 schools (approximately 1,100 classrooms) are in the government’s bilingual program (Patel, Chambo & Tempe, 2010). Of the districts visited by the research team only Ibo has schools that belong to the bilingual program, which may partially explain why more mother tongue instruction was observed at these schools. Only one school in the sample (which was located in Ibo) identified itself as participating in the bilingual program through having a few select bilingual classrooms.



However, on the day of the school visit, the bilingual teacher was absent and the students were sent to join a Portuguese classroom even though the only materials they had were in the mother tongue.

Introducing bilingual education into schools can be a challenge, especially if the supporting resources, including trained teachers and appropriate materials, are not consistently available to students. Even if a school does not participate actively in a bilingual program, it is still critical to have teachers who speak the same language(s) as the students in their classrooms. Data from the study show that in the overall sample only 48 percent of the Grade 3 teachers interviewed spoke the same mother tongue language as their students, but results varied considerably by district. In Ibo only 15 percent of the teachers spoke the same language as their students; however, they were observed the most often actually using mother tongue languages in the classroom to communicate with students. In Mecufi almost all teachers interviewed spoke the language of their students, but during classroom observations they rarely used the mother tongue to communicate with students.

Table VIII: Percentage of Grade 3 teachers speaking students’ mother tongue by district

District	% Grade 3 teachers speaking students’ mother tongue
Ibo	15%
Pemba Metuge	49%
Macomia	38%
Meluco	74%
Quissanga	45%
Mecufi	98%
Total sample	48%

Time and materials for reading skills

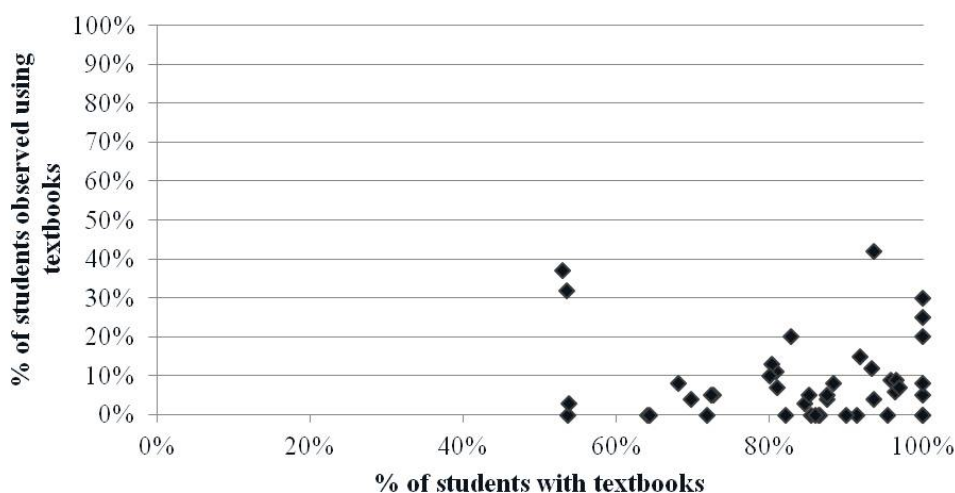
Research on school effectiveness in developing countries suggests that the availability of quality, relevant materials is a crucial factor in student achievement (Zhang, et al., 2008). In Mozambique, the government provides free textbooks for students every year and the children are responsible for their textbooks, which will not be replaced if they are lost. This means that for those students in the sample without a book at the time of the visit, it is very likely that they will spend the rest of the year without materials. For Grade 1 and 2 students the loss of the textbook has an even greater impact since the books served as workbooks and the majority of in-class assignments require the use of the text.

The majority of students in the sample (Grades 1–3) had language textbooks (80 percent), yet nearly one third of students did not have notebooks (32 percent) or writing utensils (27 percent). Students in Grade 3 were less likely to have language textbooks compared to Grade 1 and 2 (63 percent compared to 79 percent and 80 percent respectively).

In addition to the availability of student materials, teachers also require teaching guides and supplemental materials for their classes. In the 49 schools visited, only 39 percent of the Grade 1–3 teachers interviewed had a language arts teaching guide. In terms of supplementary materials, only 6 percent of the classrooms had any materials besides the textbooks.

Having textbooks in the classroom does not guarantee that the books are being used effectively to support student learning. Figure III compares the overall availability of language textbooks in the sample to their observed use. Although over 80 percent of the sample had a textbook, these books were used only 40 percent of the time or less when students in Grades 1–3 were in Portuguese class.

Figure III: Language textbook availability to textbook use in Portuguese class across Grades 1–3



Reading in the classroom

If students are going to learn to read, teachers need to provide focused time dedicated to reading activities. During interviews, Grade 1–3 teachers were asked to report how often they give their students time in class to read; only 55 percent reported that their students read independently or as a group on a daily basis, while 18 percent report that they never have students read during the school day. These self-reported data were quite different when compared to data from the classroom observations where students were observed reading independently or in a group less than 5 percent of the time (in all subjects) and only 8 percent of the observation time in Portuguese classes.



Interestingly, the ability to read or write was not the most common criterion used to determine if students would pass to the next grade. Of the 134 teachers interviewed for this study, only 9 percent indicated that students had to be able to read and/or write to pass to the next class. Forty-three percent said they based the decision on the students' grades, 16 percent report that the parents play a role in the decision and 13 percent say their students are automatically passed to the next grade.⁵

In conclusion, the data clearly demonstrates that Grade 3 students within these districts of Cabo Delgado are struggling to read. Although students are beginning to grasp the foundational skills behind print and letter recognition, they still have a very difficult time reading letters in isolation or demonstrating basic print concepts. Compounding the delayed onset of reading skills is the finding that only 63 percent of Grade 3 students have language textbooks and those textbooks are used less than 40 percent of the time in classrooms. Since the majority of the students in the sample (77 percent) reported having no books at home, the classroom is where they will have the greatest opportunity to interact with text. If students' access to print is also limited at school, then they are even more likely to struggle to develop the basic literacy skills essential for reading. Given students' level of vocabulary and knowledge of foundational reading skills, it was not surprising to find that less than 1 percent of students in the sample were able to read 50 or more words correctly per minute, while 33 percent read only 1–5 words correctly.

Factors that influence quality and opportunity to learn in Cabo Delgado

OTL Factor 1: Percentage of days school is open

Based on the research conducted in the 49 schools in Cabo Delgado, schools are effectively open 168 of 183 days a year, but instruction is only happening during approximately 30 effective days during the year. Before schools can consider improving the actual learning process, it is necessary to ensure adequate learning time is provided. In Mozambique, the official school calendar for the academic year of 2010 included 183 instructional days, with classes beginning in January and ending in October. The official start date for students to begin school in 2010 was 18 January; however, only one (out of the 49 schools in the study) began classes on this date and, on average, schools started four days later.

Data taken from teacher attendance books and triangulated with information reported by directors show that at the time of the school visits, in addition to beginning the school year late, schools had already been closed on average 6 days (3 percent of the total number of official school days) four to five months into the school year with a variance of 0–60 days reported among the school sample. Four of the schools reported that they had been closed for more than 30 days since the beginning of the school year. After factoring in the number of days schools lost at the start of the year and throughout the year, it can be estimated that schools in the sample were open on average 168 days out of the 183 planned.

The data from the school records showing consistent time loss due to school closures were reinforced by actual observations by the research team. On 19 occasions, the team arrived at the school they were scheduled to visit to find that it was actually closed that day. Directors and teachers reported that schools closed during the year for a variety of unofficial reasons, including school cleaning, holiday preparations, municipal ceremonies, visits from government officials, weather, submission of enrollment data, death in the community, and outbreak of disease in the community. Policies and regulations made at the national level also impact routines at the school level. For example, the Government of Mozambique recently changed the payment regulations making it necessary for teachers to open bank accounts and access their pay directly instead of their salaries being distributed in cash. Rural areas of Mozambique have no banks and teachers therefore have to travel long distances to the larger town of Pemba to receive their paycheck. The impact of this policy was observed first hand by the research team when, for example, in the district of Ibo, the enumerators found a number of schools closed because the teachers had chosen that week to travel to Pemba to pick up their salaries at the Bank.⁶

OTL Factor 2: Teacher attendance⁷

To ensure learning occurs teachers need to be present in the school and prepared to teach. Attendance records at the schools revealed that the average teacher attendance rate for schools in the sample was 87 percent. On average, teachers reported missing an average of 21 days (independent of school closings) throughout the school year, with a variance among schools of 5–92 days in a year. There was a significant positive correlation between students' scores on the CAP assessment and teacher attendance rates.

Collecting teacher attendance data proved to be challenging, since not all directors ensured that attendance records were completed daily. Interviews with school directors revealed that the attendance records were often kept at home and therefore not available on the day of the school visit. There also appeared to be no oversight or consistency in recording the data; and teachers whose classrooms were not physically located in the same school area as the main buildings were often not included on the school ledger or were only asked to sign once a week or month.⁸

Teachers reported missing school for a variety of reasons ranging from official trainings or seminars, distance education, or recertification to illness, a death in the family or community, or personal travel. Teachers also reported that they had to often miss a day of school to travel to the city to receive their paycheck as a result of the new Ministry policy. Directors and community members reported that teachers sometimes extend these trips for personal business, which added to the number of days they were absent from the schools.

When teachers are absent, the director would most often either ask another teacher to cover the class, keeping the two groups in separate spaces, or dismiss the students without a teacher, adding to the time lost in the school day. During the school

observations, the research team noted that students covered by another teacher were often left on their own with little attention. If in fact the teacher tried to cover both classes, time on task was drastically reduced for both groups so that all students lost most of the day. Teachers did not have lessons planned for the additional classes they were asked to cover, nor did they have teacher guides since the principle teacher kept her materials at home with her when she was absent. As a result, teachers who were asked to cover additional classes were unprepared to lead the students in any activities. On occasions when two or more teachers were absent, enumerators observed that the director would sometimes dismiss the entire school.

OTL Factor 3: Student attendance⁹

The average student attendance rate (according to official school records) was 78 percent, equivalent to a loss of 32 days a year. Schools reported a range of attendance rates, from a low of 39 percent to as high as 98 percent. Student attendance rates at the district level were similar, with schools in the Mecufi district having the highest attendance rates at 84 percent. Student attendance rates were positively correlated with the number of words they could read per minute, ($p=.06$).

Gathering student attendance data was challenging because teachers did not take attendance on a consistent basis. Only 67 percent of teachers had an attendance book on hand on the day of the visit. Teachers gave a variety of reasons to explain the lack of attendance records; most often stating they had left the book at home or that they were not keeping attendance because the government had yet to provide them with official record books. Teachers also stated that students did not all arrive at the same time and since many would enter class late in the day, it was difficult to keep track of attendance. When teachers were assigned to cover other classes, either on a short-term or long-term basis, they would often be left without an attendance book because the previous teacher would store it at home or had taken it to their new school. The government-issued attendance books that were found at schools were often those designed for secondary schools and teachers were unwilling to use them in their own classes.

During the interviews, Grade 3 students were asked whether they missed class last week; 24 percent reported missing school the previous week. These students were absent, on average, three days during the previous week. Fifty-four percent of students said they did not come to school because they were sick, 15 percent had to work in their fields, 7 percent did not want to come, 4 percent had to work at home and the rest provided reasons varying from taking care of younger siblings to that they were not sure. Only a small sample of students reported that they tended to miss school regularly throughout the year to work outside the home. A positive correlation was found between the distance students reported traveling to school and whether the child missed school the week before ($p=0.02$) meaning that students who had to travel longer distances were more likely to miss a greater number of days of school.

Enumerators also took attendance in the classes that they observed. When comparing the attendance taken on the day of the visit and the official number of students enrolled

in the class, the attendance rate was found to be on average 45 percent. This means that on the day of the visit, over half of the class tended to be absent. Attendance rates varied between and within schools, from only 11 percent of the enrolled students present on the day of the visit to 100 percent. Based on this finding, it is likely that the student attendance rates are much lower than school records suggest, and should be a focus of any intervention designed to improve learning outcomes.

OTL Factor 4: Percentage of the school day available for instruction¹⁰

A great deal of instructional time is lost during the school day because of a shortened school day (late start and early release) and extended recess times. In Mozambique the official school schedule includes six 45-minute periods and five break periods (four 5-minute breaks and one 15–20 minute break). Based on this schedule, there should be a total of 310 minutes (5 hours) in a school day, of which at minimum 270 minutes (4.5 hours) should be used for instructional time. Schools in the sample were observed to only use a total of 161 minutes (2.7 hours) of the 270 minutes (4.5 hours) for actual class time. Researchers noted that schools almost always started late and ended several hours earlier than scheduled leading to an average loss of time of 111 minutes (almost 2 hours). The variance among schools ranged from a minimum of zero minutes to a maximum of 206 minutes of time lost, with similar patterns observed in all six districts.

In addition to late starts and early release, schools in the sample lost an average of 40 minutes during the recess periods, with a variance among schools of between 0–104 minutes. When the time lost because of a late start, an early release, and extended recess was combined, students spent an average of 158 minutes in the classroom—or the equivalent of only two-and-a-half hours, i.e., only half their scheduled lesson time was available. As with the other indicators, there was little if any difference between the districts with Ibo having the lowest potential time for instruction at 42 percent and Pemba Metuge had the highest amount of potential learning time remaining at 59 percent.

To accurately document this situation, the research team arrived at each school at least 10 minutes before the official start time and stayed until school was dismissed. Classes often started late because not enough students had arrived and/or the teachers were not present on time. In the morning shift at many schools, if teachers arrived in the middle of the scheduled first period, they would wait to begin classes until second period officially started. Directors and teachers reported a variety of reasons for ending the school day early including students' hunger, weather conditions, lack of light in the classrooms, and the long distances students and staff walk to get to school. In some areas at a certain time, contact with wild animals such as elephants can become an issue and teachers do not want children walking alone then. Even though schools have the autonomy to adjust the daily start and end times to fit the needs of the community, schools in the sample appeared to prefer to cut the school day as opposed to adjusting the class schedule.

OTL Factor 5: Percentage of student time-on-task

Instructional time is a multi-faceted concept (Berliner, 1990). Although the importance of sufficient instructional time and its impact on student achievement is well documented in literature (Berliner, 1990; Benavot & Amadio, 2004; Abadzi, 2009), the length, type, and focus of time for improving student learning remains unclear. Although research may not yet have determined how many hours are sufficient for improving academic achievement, it is important that schools are maximizing the time provided to support students' learning. To begin to examine the loss of 'effective' instructional time in the classrooms included in the study, measures were included to evaluate how much time teachers and students spend on and off task during the time they are in class.

Overall, when Grade 1–3 teachers in the sample were observed to be on task, their students also tended to remain engaged in the classroom activity. This pattern demonstrates that student engagement in academic activities depends greatly on the level of engagement by the classroom teacher. In fact, student and teacher time off task showed a strong positive correlation.¹¹ If we consider student participation only during that time when teachers themselves were on task, the data show that in the overall sample, when teachers are actively engaged in the classroom activity, students spent 75 percent of the time on task. In comparison, when teachers were off task, students only spent 21 percent of the time engaged in academic activities. When not engaged in an academic activity, teachers in the sample spend their time engaged either in classroom administration activities (23 percent), out of the classroom (12 percent), socializing (9 percent) or disciplining students (4 percent).

Types of activities

Across the sample, students spent an average of 50 percent of the time on task and teachers an average of 52 percent. However, there was a considerable difference in time use between schools. Student time-on task ranged from 14 percent to 80 percent, while for teachers it varied between 0 percent and 83 percent. As shown in Table VIII, when students were engaged in an academic activity, the majority of the time was spent on seatwork (individual tasks assigned to the students) (14 percent), followed by copying (9 percent) and question/answer exercises (9 percent). Children were never observed reading silently, but on average, during classroom observations, children did read aloud 5 percent of the time.

Table VIII: Average percentage of students by type of activity in classroom observations

Type of activity	Sample schools
Reading aloud	5%
Silent reading	0%
Demonstration/lecture	8%
Question/answer	9%
Practice/drill	2%
Seatwork	14%
Copying	9%
Verbal instructions	3%
Student Time off task	50%
Teacher Time off task	48%

There was little variance between districts, but students were observed to be off task most often in Macomia (55 percent) and least often in Meluco (40 percent). There was also very little difference in the types of activities conducted in the classroom across districts or grades.

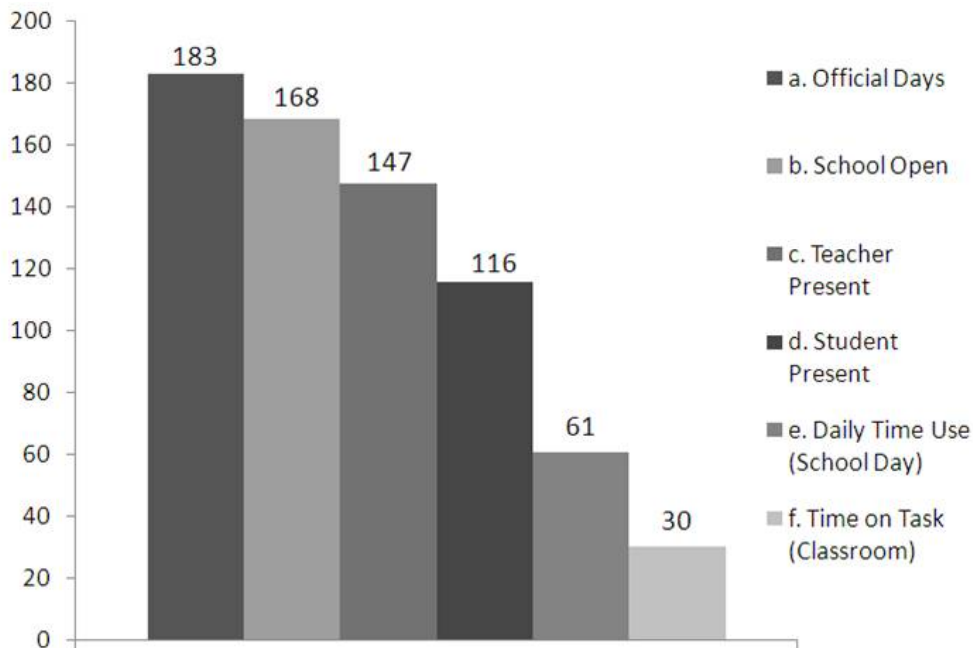
OTL Factor 6: Equivalent percentage of days available for instruction

To estimate the equivalent number of days available for learning, we subtract from the total days in the school year (183) the number of days school was closed, the number of days lost due to teacher and student absence, the amount of instructional time lost because of late opening/early close/recess, and the number of days lost because students were off task.

Using the graph that represents data from the total sample of the schools visited, it is possible to construct the reality of an average student. The student may show up to school every day and find that on average, the school is closed 15 days out of the year, leaving only 168 for instruction. However, on average, that student’s teacher comes to school only 147 days of the remaining 168. The student is also often absent, attending only 116 days out of the year. On the 116 days the school is open and the student and teacher are present, s/he loses a considerable amount of time in the classroom due to the fact that the school opens late, ends early or does not adhere to the recess schedule. At this point, the student is only left with the equivalent of 61 days of full instruction. Yet, even when the student is in the classroom, there is time loss. The student waits passively as the teacher copies pages on the chalkboard; he or she spends the period chatting with a neighbor; the student did not bring a notebook so he or she cannot complete the assigned exercise. As demonstrated in Figure IV, after accounting for this loss of time within the classroom, the student’s 183 days of learning have now been reduced to the equivalent of 30 days spent on task in the classroom.



Figure IV. Total number of effective days of instruction lost by indicator



There was some variance in time lost across districts, but not much. After these five factors were accounted for, differences in the days remaining for instruction varied from 22 days (12 percent of the school year) in Quissanga to 34 days (20 percent of the school year) in Pemba Metuge. The greatest time lost across all districts was related to daily time lost (i.e., late school opening, early closure, extended recesses).

OTL Factor 11: Class size

Class size is relevant as a factor because it acts as a proxy for the time a teacher can provide to his or her students. Class size data were taken from the director’s official record and triangulated with teacher’s attendance books when possible. The average class size across the sample was 43 with a range of 14–110 per class. These results were similar across all districts but varied slightly by grade. The average class size for Grade 1 was 46 with a range across the sample of 16–80 students. In Grade 2, the average was slightly lower—44—but had a much wider variance of 19–110 students per class. In Grade 3 the average was lower at 41 with a variance of 14–98 students per class, depending on the school. It is also important to note that on the day of the school visit, the observed class size was consistently smaller than the reported enrollment rates. During the classroom observation, enumerators noted the average observed class size was 20, with a range of 2–64 students.

OTL Factor 12: School support

School support visits are critical to school improvement process and important to provide direct instructional support to teachers. In the sample, 34 schools reported that they had been visited at least once by either someone in the Ministry of Education, the district education director, someone from AKF, or someone from another organization. Seventy percent of the schools reported they had been visited by the district education director. Twenty-three percent of schools in AKF-supported districts reported receiving a visit from someone in the organization. Eighteen percent of all schools had been visited by another organization.

Table IX summarizes what types of visits were made by the different groups to the schools. Each visit could have been related to more than one area. Few of the visits were related to parents and/or the community and the majority had something to do with school management or teaching and learning.

Table IX: Total number of schools that reported receiving visits by type of visit and percentage of visits that related to different support services

Visitor	# of schools receiving visit	Teaching and Learning	Classroom Mgmt	Evaluation	School Mgmt	Materials Delivery	Parents and Community
MOE	9	50%	50%	50%	60%	0%	10%
District Education Director	32	77%	50%	70%	73%	41%	14%
AKF	9	14%	0%	0%	20%	0%	7%

Although 25 percent of teachers in the sample reported that the school director or the pedagogical director visits their classrooms one to three times a year and 12 percent reported being visited on a weekly basis, 17 percent of teachers reported that the feedback was generally focused on positive or negative comments rather than direct instructional support. Thirty-eight percent reported that the director commented that there was a need to improve the teaching and learning in the classroom, 28 percent received comments on improving classroom management and 9 percent were specifically told they needed to work on the students' reading and writing skills. The others received no specific feedback. Directors indicated that 50 percent of the time, visits focused on improving teaching and learning, while 11 percent of the time, visits focused on improving classroom management. Interestingly, the feedback provided by the director was more often around classroom management (54 percent) than on ways to improve teaching and learning (27 percent).



Policy Implications and Recommendations

Research indicates that to improve students' learning levels, a basic opportunity to learn must exist (Bloom, 1968; Gettinger, 1984; Benavot & Amadio, 2004; Abadzi, 2007a). This opportunity to learn requires that teachers and students are present every day and that they spend most of the day engaged in learning activities. Research further indicates that too much instructional time is wasted in classrooms due to poor classroom management, disciplinary action, long transition times, and teacher and student absenteeism; educators must make more efficient use of the existing time available for instruction (Stallings, 1980; Aronsen, et al., 1998).

The main findings across the five districts of Cabo Delgado include: a) a great deal of instructional time is being lost—more than 75 percent of the total effective days of available instruction; b) little, if any, classroom reading instruction is taking place (i.e., 5 percent of in-class time is spent on any kind of reading activity); and c) students' reading abilities were low—more than 90 percent of the sample could not read even 10 wpm.

Time spent on learning activities matters and is predictive of academic achievement if properly used for engaged academic activities (Latham, 1985; Hollowood, et al., 1994; Brophy & Good, 1986; Greenwood, 1991). Research by Stallings (1980), Aronson, et al. (1998), and Abadzi (2007a) also shows that the amount of time allocated to and used for learning is significantly reduced by non-academic activities, students' transitions between classes or topics, poor classroom management, and disciplinary activities.

Sample schools in the districts of Ibo, Meluco, Macomia, Pemba Metuge, Quissanga, and Mecufi used on average less than a quarter of the available opportunity to learn (30 of the 183 available days for instruction). In the classroom, students spent the majority of the time doing individual assignments at their desks, discussing subjects, and copying. A limited amount of reading (5 percent of the time observed) took place in the lower primary grades and no classroom time involved students reading silently or analyzing text. Although textbooks were often available in the classroom—in limited supply in some cases—researchers witnessed limited use of these books (less than 40 percent of available time).

Decades of school improvement work have focused on helping children learn through interventions such as teacher training, the provision of materials, and improved pedagogical methods. Yet, school quality still poses a challenge for educators and policy-makers alike. The answer to improving school quality and learning at times seems elusive. Where should policy-makers and educators invest their resources? How should they prioritize interventions? The following discussion and recommendations provide insights into interventions that could improve the classroom environment and help children learn.

Ensure availability and use of print materials

In the Cabo Delgado sample schools only 63 percent of Grade 3 students had Portuguese textbooks and the use of textbooks was fairly limited. Snow, et al. indicate that in the early grades, factors such as time, materials, and resources should support both daily independent reading of texts (selected based on student interest) and daily assisted reading and rereading of more difficult texts that advance students' linguistic abilities. This approach to reading was rarely seen in classroom observations.

The availability and use of textbooks and other complementary reading materials has important policy implications. First, as noted by Snow, et al., textbooks should not be provided without helping teachers integrate these books into their instructional practice. Training to effectively use textbooks should include pedagogically sound approaches such as activity centers that emphasize phonological awareness, silent reading of story books, and peer reading.

Second, as Snow, et al. point out, students should have storybooks that are below their frustration level (to encourage reading), and students should practice frequently. Practice reading is essential for literacy among lower primary grade students. Schools should consider providing storybooks in Portuguese (and mother tongue if possible) to encourage reading. These storybooks should be age and culturally appropriate and illustrated so students are drawn to the content and relate to the stories the books tell. Examples of texts that children could read should engage children's imaginations and excite them about learning to read.

Except for a handful of schools, no storybooks were available in Portuguese for students to read in the classrooms visited during this study and the passages within the textbooks were far above the students' reading levels. Reading materials in their mother tongue language were also limited to the textbook and only for those children enrolled in the bilingual stream. Since the textbooks (in Portuguese) were produced at a national level, the stories within the books often did not relate to the reality of the students who were reading the books.

International development organizations and developing country governments need to recognize the lack of children's storybooks as a missing ingredient in promoting literacy. Learning to read will always be an uphill battle in environments devoid of interesting reading material. Projects, programs, and policy need to recognize that creating literate environments and developing a culture of reading are as important as the need to focus on better in-school reading instruction. Projects, programs, and policy also need to ensure that providing storybooks is accompanied by their use. These storybooks ideally connect children to their culture and can open student up to new worlds and contexts. When possible, the books should be provided in both the official language of instruction and mother tongue language. For example, in Guatemala, Save the Children provided schools with Mayan storybooks. These storybooks told children stories about their Mayan ancestry in simple and easy-to-access language that the students could

relate to given their own heritage. The books were also rich in pictures and drawings that visually engaged children.

Link teacher professional development to literacy acquisition strategies

Linked to the idea of promoting the proper use of books in classrooms is the prevailing approach to teacher in-service training and support. Too often teacher professional development models focus on simply providing new instructions to teachers in a general area and expecting them to transfer this knowledge into practice. This form of teacher training fails to bring about any substantial improvement in teaching practices, as noted by Villegas-Reimers. Instead, a behavior change approach is needed that identifies the specific classroom-based practices needed by teachers, and breaks down these practices into manageable increments of behavior change. This help must consist of the chance to practice in a safe environment, of clear benefits to teachers exhibiting the new behavior, of consistent evaluation and feedback, and of supportive organizational cultures within schools and communities that encourage these behaviors.

Observations in the schools indicated fairly low time on task and a consistent lack of engaging instruction in the early grades. In particular, the study found a lack of instruction tailored to the acquisition of the foundational aspects of literacy. Behavior changes for teachers should improve time on task, specifically in literacy acquisition-related activities. This could be as simple as creating time for reading: teachers reading to students, students reading to students, and students reading by themselves. More importantly, early primary teachers need to learn the fundamental elements of teaching reading (e.g., sound–letter correspondence, oral blending of sounds to read words, sight vocabulary) and need specific classroom practices that reinforce these elements. Classroom practices must link to the use of textbooks and other reading materials to improve learning and engagement of students. These strategies also need to be consistently applied by teachers in the classroom.

The implication for policy-makers is twofold. First, classrooms must be equipped with additional materials such as easels, storybooks, and supplies for students to create reading materials (including letter and word cards). More important is the link between the provision of these new materials and teacher training and support to ensure they are used in ways that help students learn to read. In this lies a more complex set of investments with unclear financial trade-offs that should be carefully examined in each context.

Provide remedial or accelerated support

Schools also need help developing remedial strategies, given the high percentages of students found in this study that were unable to read or reading at low levels of fluency in Grade 3. Vaughn and Linan-Thompson write that students should learn to read by the end of their first year in school but almost all of the students in this study were not reaching that goal. Unless specific strategies are deployed to ensure those students learn to read, they will simply fall further behind. Introducing interventions such as accelerated learning programs, after-school tutoring, and special classes for students

who are behind are strategies that need to be deployed more systematically in schools similar to those in this study. If schools do not make an effort to help students catch up, it is more likely that children will drop out before they finish Grade 5. Furthermore, if students are not leaving schools with an increased skill set, parents are going to be reluctant to send children back for another year or to enroll their siblings.

Use formative and summative assessments

Linked to the idea of providing remedial support to students who are behind is the ability to assess students' literacy levels and identify those who are acquiring the building blocks for competent literacy and those who are not. The USAID-funded Ed Data II project continues to improve the Early Grade Reading Assessment employed in this study, demonstrating its utility in a variety of settings and languages. Such tools need to be used more systematically, not only to gauge whether learning is occurring, but also to allow teachers to spot check their students' progress. Diagnostic instruments such as EGRA, continuous assessments that assess students knowledge against smaller benchmarks (i.e., completion of a mathematics unit), and monthly formative assessments can help teachers deploy instructional interventions that respond to their students' needs, including identifying students who need significant remedial support.

The OTL index includes reading fluency as an indicator of school effectiveness. This index provides a tool that can be used to contextualize the information about learning outcomes provided by EGRA. The OTL index provides educators, program managers, and policy-makers with useful, time-relevant data about variations among schools across the 12 factors. This set of school effectiveness data can direct more targeted support to where it is needed. For example, one school may have high time-on-task percentages, but high teacher absentee rates. This knowledge could help a community or education official focus on the specific issue at the school, in this case determining why teachers are consistently absent. The OTL index would allow individualized support to schools by allowing supervisors to collect school-relevant data.

Increase school support services

EQUIP2 complementary education research (DeStefano, et al., 2007) found that school support services (i.e., visits to the schools by supervisors, Ministry officials, or NGO support personnel) were critical to the effectiveness and cost-effectiveness of complementary models.¹² However, the data on school support services in Cabo Delgado suggest that the investments in school support are translating appreciably into neither improved opportunities to learn nor better learning outcomes for students. Although the schools receive some, albeit uneven, support from both Ministry support personnel and NGOs, the type of support tends to be focused on classroom management or school management rather than on direct instructional support (i.e., providing direct instruction to teachers on how to teach lessons they are struggling to deliver). If schools that receive ongoing support are unable to implement the changes that lead to better use of time, then how can one expect schools to meet these challenges on their own? Support resources need to be devoted to instruction, in particular to



ensuring teachers know how to teach lessons in mathematics and reading. Unless there is a greater focus on instructional alongside administrative support, visits to schools by officials will continue to have limited impact on the actual OTL and learning outcomes obtained in schools.

Conclusions

Although national and international organizations and governments that work in education may strive toward the same outcome of improving student learning, different inputs may be required to reach this goal. In this study, based on observations and data collected, AKF (Moz) observed that a key area for improving student learning is to first guarantee that children are provided the basic opportunities to learn and they are learning to read. Ensuring that schools are open and teachers and students are present will support the impact of classroom and support interventions by ensuring that there is more time available for instruction, but this is not enough. There needs to be an increased focus on building foundational skills in reading. Teaching students to unlock the meaning of text is the single most powerful skill teachers can foster (Lemov, 2010). To help early grade students improve their reading, teachers need to have a clear reading curriculum and be trained on how to teach reading. They need to spend increased classroom time teaching skills such as decoding, fluency, vocabulary, and comprehension, and students need quality time reading with interesting and engaging print materials. Mother tongue instruction can be a critical factor for children in the first years of school to help build their understanding, interest, and confidence for learning.

Although there are trade-offs and political challenges to each of the implications discussed above, it is important that educators begin to look at concrete ways to ensure that students learn to read. The OTL index can serve as a useful tool to gauge students' progress. As an evaluative tool, the index allows ministries of education to see school variation at the region, district, or national levels and target appropriate interventions according to need. For example, schools in one region may consistently start late, causing a loss of instructional time that simply requires better supervision to ensure on-time starts. Another region may face extreme losses due to off-task teachers and students. Understanding these nuanced differences can help target interventions. At the school level, principals and community members can compare their school to a national average, yet understand the variations in their community and region and gauge their progress against other schools. Finally, the OTL index can serve as a tool for communities to improve the accountability, governance, and management of schools.

Communication and Dissemination

The dissemination of findings from the present study has occurred throughout most of 2011 from the school/community level up through district, provincial, and national levels involving key stakeholders from the government, civil society, and teachers and local parents. Results from the study have also been shared internationally through conference presentations at CIES, UKFIET, SID, and at various universities that are partners under the EQUIP2 program. From both AKF and EQUIP2/FHI 360's

perspective, this purposeful and layered dissemination process is needed to encourage debate, problem solving, and joint ownership with all relevant actors regarding next steps and address the different factors that affect opportunities for learning that are so clearly outlined in this report. At national level, there are good indications that the findings have begun to inform the current planning related to the Ministry of Education's next five year strategic plan for education. The district and local school/community level, however, is where AKF (Moz)'s education team has focused most diligently.

At the school/community level, local school councils, parents, school directors and teachers, and students have been brought together to reflect on the findings and think together what solutions and strategies might work in their locale. During these gatherings, several school council members articulated a desire to tackle the issues related to teacher and student absenteeism themselves. The discussions also highlighted that many school council members are not necessarily fully aware of their rights and responsibilities to oversee student, teacher, and school director attendance. As a result, AKF has begun to disseminate the official guidelines and regulations for school councils and changes are now being observed. For example, one school council now requires the school director and teachers to request permission for any anticipated absence.

At the school cluster level (called ZIPs), the ZIP coordinators along with district and education officials requested AKF (Moz) to work with them on clarifying the roles and responsibilities of different stakeholders and strengthening their capacity to do so. Their hope is to improve district and regional level monitoring systems functioning and encourage their effective support of local schools needs. A fundamental aim of this process has been to ensure broader understanding of the different factors at play undermining learning and then create strong buy-in (ownership) of different stakeholders for moving forward.

The findings have also shaped and refined AKF (Moz)'s planning regarding what needs to happen inside classrooms and within the broader school and community environments so that the quality of learning improves. In terms of availability of reading materials, the team already had begun to collect local traditional stories over the last few years with the aim of adapting these for beginning readers and for use with others, including the community preschools as well as for those participating in/or completing adult literacy classes to read with their children. They plan to make these available in multiple mother tongue languages and also distribute them to the ECAs—the community learning spaces that are managed by local communities and are based outside the formal school setting. The ECAs are also under review to improve their functioning and use—including for learners enrolled in double shift schools—as a way to creatively provide more opportunities for learning.

In addition, and related to the need to strengthen teachers understanding and capacities, AKF(Moz) will be working jointly with district education officials and local ZIP coordinators to reinforce support to teachers in the early grades so that the foundational



skills are indeed in place by end of Grade 5. Particular focus will be given to fostering early language, literacy and numeracy skills through better use of effective teaching and learning approaches, textbooks and other materials; introducing doable continuous assessment in the classroom; as well as, encouraging peer-to-peer interactions and support within schools and clusters. In sum, the study's results reinforce clearly AKFs and others' experiences that to ensure regular, relevant and sustainable opportunities to learn—especially in very poor and underserved areas such as Cabo Delgado—it is critical to tackle the various factors identified in this study. Tackling only student/teacher attendance, making relevant materials available, or ensuring teachers are confident and know how to teach foundational literacy and numeracy is not sufficient.

Internationally, the findings from this and the four additional EQUIP2 case studies have influenced country projects in Guatemala, Nepal, Ethiopia, Honduras, and Peru. The World Bank and DFID have adapted various aspects of the study to collect additional data in both Latin America and Africa, with the World Bank training more than 650 teachers, supervisors, and MOE officials across six countries in the LAC region in how to conduct classroom observations to better understand time use and the quality of teaching in classrooms. As international, national, and local dissemination continues, it will be critical to continue learning and ensuring the impact of the interventions intended to improve time use and teaching and share the results broadly.

Notes

¹ In 2009, only 7.6% of students (up from 6% in 2008) finished the lower cycle of primary education at the appropriate age.

² The reading assessment tools for this study were adapted from the EGRA instruments developed by RTI under the USAID-funded ED DATA II project. The Concepts about Print tool was adapted from a similar instrument developed by Mary Clay and used by Save the Children.

³ The authors note the research on Romance-based languages because 60 wpm has become the standard internationally for reading fluency. However, there is no clear research around other non-Romance-type languages such as Arabic that indicates appropriate benchmarks for reading fluency at Grade 3.

⁴ Proportionate to the total number of students in the sample from each district, Macomia still had the greatest number of students reading 11 wpm and above. Ten percent of the total population of students from Macomia could read at this rate as compared to 5 percent from Quissanga, 3 percent from Meluco, 2 percent from Pemba Metuge and Ibo, and 0 percent from Mecufi.

⁵ Primary education in Mozambique is divided into three cycles: Cycle 1 includes grades 1 and 2; Cycle 2 includes grades 3 to 5; and Cycle 3 includes grades 6 and 7. Automatic promotion exists within cycles, but students must pass an assessment to move to the next cycle.

⁶ This new policy had just been implemented when the data collection began so schools had yet to develop a way to get teachers paid and keep the schools open. The visit to Ibo also occurred after Easter break and teachers may have taken advantage of the holiday to extend their stay to open bank accounts.

⁷ Teacher absenteeism rates were calculated based on data recorded in staff attendance books and triangulated with data provided by teachers in interviews. In schools where the director also taught a class, his/her attendance is included in the overall teacher attendance rate.

⁸ Many of the schools visited had a main campus and an annex school that is formally linked to it. Annex schools were introduced mostly in remote villages with the goal of encouraging younger children to enroll in school earlier. They are generally located closer to the main village and most often include only the early grades.

⁹ Attendance rates were calculated based on the number of days that teachers took attendance and the number of students in the class list. The calculation is: total number of student absences recorded to date (total number of students x total number of days attendance taken).

¹⁰ Actual instructional time was calculated based on the school observation records generated by the research team during the field visits. The team calculated the actual



instructional time as the difference between the official duration of the school day in Mozambique (five hours and ten minutes) and the total time lost when students were not engaged in instructional activities inside their classrooms. This lost time is made up of official and unofficial breaks, extended recess, time lost to a late start to the school day or an early dismissal. Although breaks and recess are a necessary part of the school day, this is time when students are not engaged in learning activities in the classroom.

¹¹ The correlation was ($p < 0.000$)

¹² Complementary education approaches are defined as models that work to support the formal public system, offering students an alternative route to achieving the same educational outcomes as students in the government schools. The programs are designed to feed students into the government system at various entry points and are large enough to exhibit many of the same characteristics as mainstream schools. However, by using similar (though often reduced) curriculum as the government schools, providing instruction in the student's mother tongue language; and ensuring that the teacher and learning materials are present in the classroom, the models more effectively keep children in school and help them learn.

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