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Absenteeism and Beyond:

Instructional Time Loss and Consequences

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Abstract

Studies have shown that learning outcomes are related to the amount of time students engage in learning tasks. However, visits to schools have revealed that students are often taught for only a fraction of the intended time, particularly in lower-income countries. Losses are due to informal school closures, teacher absenteeism, delays, early departures, and sub-optimal use of time in the classroom. A study was undertaken to develop an efficient methodology for measuring instructional time loss. Thus, instructional time use was measured in sampled schools in Tunisia, Morocco, Ghana, and the Brazilian state of Pernambuco. The percentage of time that students were engaged in learning vis-à-vis government expectations was approximately 39 percent in Ghana, 63 percent in Pernambuco, 71 percent in Morocco, and 78 percent in Tunisia.

Instructional time use is a mediator variable that is challenging to measure, so it often escapes scrutiny. Research suggests that merely financing the ingredients of instruction is not enough to produce learning outcomes; students must also get sufficient time to process the information. The quantity-quality tradeoff that often accompanies large-scale enrollments may be partly due to instructional time restrictions. Time wastage also distorts budgetary outlays and teacher salary rates. To achieve the Millennium Development Goals students must get more of the time that governments, donors, and parents pay for.

This paper—a product of the Sector, Thematic, and Global Evaluation Division (IEGSG), Independent Evaluation Group (IEG)—is part of a larger effort in the department to develop innovative indicators and improve the assessment of learning outcomes in the Bank's education lending portfolio. Policy Research Working Papers are also posted on the Web at http://econ.worldbank.org. The author may be contacted at habadzi@worldbank.org.

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Produced by the Research Support Team

Acronyms

BNPP	Bank-Netherlands Partnership Program - Global and Regional Initiatives
CNIPRE	*Centre National de l'Innovation Pédagogique et des Recherches Educatives* (National Center of Innovation and Educational Research)
EARC	Educational Assessment and Research Centre (Ghana)
EFA	Education for All
FTI	Education for All Fast-Track Initiative
HDNED	World Bank Human Development Network
IBE	International Bureau of Education (UNESCO)
IEG	Independent Evaluation Group
OECD	Organization for Economic Cooperation and Development
PASEC	*Programme d'analyse des systèmes éducatifs*
PPAR	Project Performance Assessment Review
PIRLS	Progress in International Reading Literacy Study
SAEPE	Education Evaluation System of the State of Pemambuco
SACMEQ	Consortium for Monitoring Educational Quality
SPSS	Statistical Package for the Social Sciences
TIMSS	Trends in International Mathematics and Science Study
WBI	World Bank Institute
USAID	United States Agency for International Development
UNESCO	United Nations Educational, Scientific, and Cultural Organization

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EXECUTIVE SUMMARY

To fulfill the millennium development goals and attain universal primary school completion by 2015, the donor community has made intense efforts to increase the education budgets of low-income countries so that they can pay for buildings, salaries and materials to provide quality education. The attainment of the Education for All goal depends on the ability of countries to translate financing into time and opportunities for students to learn.

However, the delivery of basic educational services to the poor often falls far short of expectations. Curricular objectives must be covered within specific numbers of hours or days. But in low-income areas worldwide, from Brazil to Niger, only a fraction of the intended instructional time is used for learning tasks. Schools may close informally before or after holidays, start late in the day or end early. When teachers are present, they may be engaged in activities other than teaching. One outcome of limited instruction is an inability to read fluently (if at all) until the later primary grades. Lacking parental support, poorer students tend to fall behind early and repeat grades or drop out illiterate.

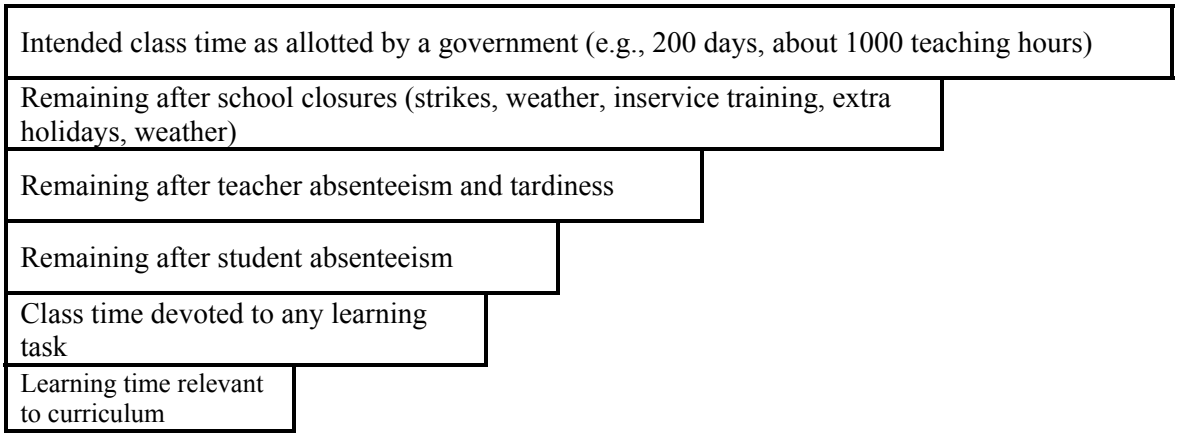
To assess the magnitude of the problem and find methods to measure it, a team of World Bank staff obtained grant funds from the government of the Netherlands. First the existing research was reviewed, that highlighted the following issues:

- Worldwide, governments define the number of days or hours that schools should teach specific material, usually 850-1,000 instructional hours or 180-220 days per school year, aside from breaks and extracurricular activities. (In poor countries, however, overcrowded classes may be split into two, with resulting 40% loss in instructional time and reduced learning outcomes.) Instructional time surveys are few in lower-income countries and may have measured just one aspect of time loss. For example, schools were found to be open 70% of the official time in Mali and 114 days of the official 200 days in Honduras, while a Dominican study reported an overall time use of 65%;

- Instructional time wastage is often linked to impoverished environments. Studies in the US found that schools serving the poor often have lower time-on-task and spend this time less effectively. For example, socioeconomic differences were found in the amount of time students spent learning to read, with classroom interruptions and disruptions more frequent in low-income areas. Poorer students were found to spend 5% less time per day engaged in academic tasks than schools in better-off areas and need to attend school 1.5 months during the summer break in order to attain an equivalent amount of engaged learning time; time wastage accumulated over the years places poorer students at risk;

- Teacher absenteeism has figured prominently as the culprit in the wastage of education investments. Surveys have shown figures ranging from 11% in Peru, 21% in Indonesia, 27% in Uganda, 30% in Kenya. Overall, 20-25% of school staff may be absent on any given school day, with higher rates in rural schools.

The absenteeism findings have received much attention and have led to calls for increased teacher accountability and incentives to improve attendance. But absenteeism is only one of the reasons for limited instruction. School closings and poor instructional time use inside the class are important ones as well. Wastage in small amounts constitutes significant loss of time in the long run. For this reason, an instructional time loss model was developed from research evidence, and some parameters were estimated.



How much of the theoretically available school time is in fact used to engage students in learning activities?

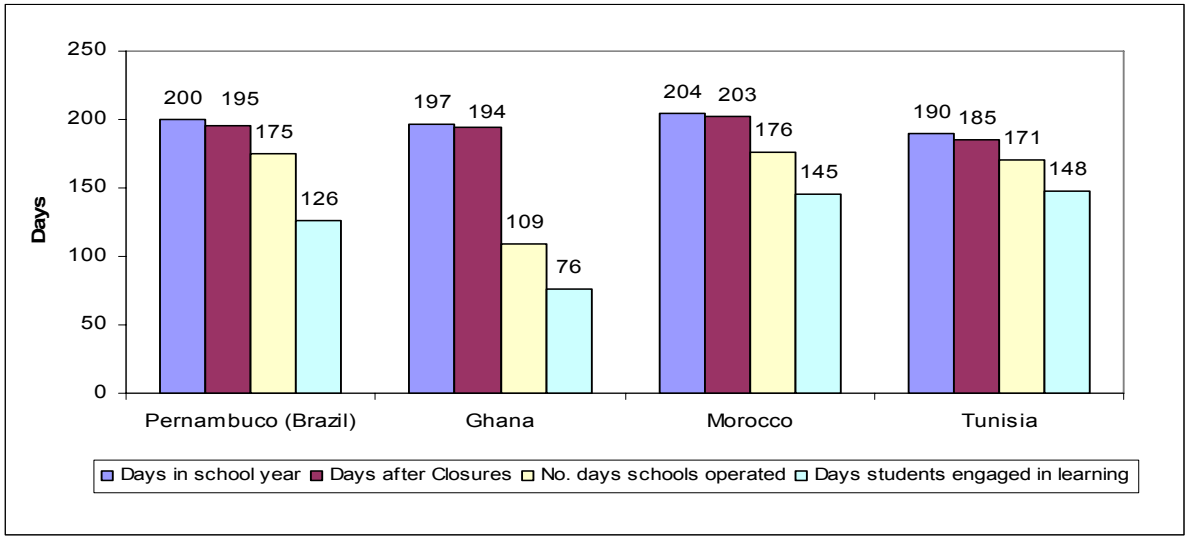
The study studied instructional time loss in four countries: Ghana, Morocco, Tunisia, and the Brazilian state of Pernambuco. A methodology was developed in 2003, and data were collected in 2004-2005 through surprise school visits, classroom observations, and surveys. Instructional time losses varied by country. In Tunisia, the country with the most efficient use of time, students were engaged in learning 79% of the available time. In Ghana, however, students were engaged in learning only 39% of the time, and in Pernambuco 63% of the time.[1] Morocco had indicators somewhat lower than those of Tunisia (using 71% of time for learning), but school closures may have been underreported. Translated into number of days effectively available for learning, losses are palpable. For example, only 76.3 days were devoted to learning tasks of the 197 officially available to Ghanaian students, while for Tunisian students 148.1 of the 190 days officially available were devoted to learning tasks. In effect, Tunisian students get twice as much of the intended classroom time as Ghanaian students.

Within each country, time use among schools showed substantial variability. Most of them used the time rather well, but a minority had substantial losses and skewed the averages. Across countries, teacher delays and absences (legitimate or otherwise) resulted in losses of 11.5 to 43 days during the school year. Classes lost were rarely recuperated. The number of days schools were closed for various reasons during the school year was reported as low, from 1.4 day in Morocco to 4.8 days in Pernambuco. However, no details were asked about the timing and reasons for closures or about partial cancellations of classes, so these figures may be underestimates. For example, in Morocco schools may cancel classes for several days so that students can study for final exams.

1. In the summary and abstract percentage of time loss figures have been rounded for brevity.

The most significant block of time lost tended to be inside the classroom. Ghanaian teachers spent 70% of the time engaging students in learning, while Tunisian teachers spent 87% of the time. The non-instructional time (some of which is necessary) was taken up with organization or management activities that included giving instructions, textbook distributions, socialization, or the teacher being out of the room. It ranged from 13% in Tunisia to 28% in Ghana.

Figure 1. Expected and Actual Number of Days Students were Engaged in Learning



Engagement rates of 70-80% in class may seem substantial, but the activities observed might not result in optimal learning. Lecturing made up much of the interactive learning time, which if prolonged can result in limited student attention and subsequent recall. Instructional materials could focus attention and help students retain specific items, but they were infrequently used. Students were taught mainly through blackboard and notebooks, with manipulables and audiovisual equipment used only about 3% of the time. Textbooks were used from 23% of the time in Pernambuco to 7% of the time in Ghana, where few exist. The average class size was modest (from 25 students in Pernambuco to 31 in Morocco) and could allow for interactions with individual students. However, teachers in all countries addressed the entire classroom 70-90% of the time, so some students had limited opportunities to get feedback and reinforcement for learning. Furthermore, less than 5% of the time was spent in group activities in any country. Overall, students mainly listened to subject matter through "chalk and talk" presentations; they had few opportunities to contemplate it through activities that would result in better recall.

Possibly due to poorly organized learning activities, 19% students in Ghana and 21% in Pernambuco were found to be "off task", that is uninvolved with class activities. By comparison, only about 10% of Tunisian students and 9% of Moroccan students were uninvolved during class. Disengagement from learning activities (student off-task rate) has been linked to achievement outcomes in US research. Therefore, Tunisia and Morocco offered not only more class time in learning tasks, they also engaged a higher percentage of students in learning than Pernambuco and Ghana. Arguably the former countries teach students more efficiently than the latter.

Test scores available for schools in Pernambuco showed significant relationships between achievement and various time indicators. Socioeconomic data, available in Pernambuco and Morocco, also suggested relationships with instructional time measures. Particularly in Morocco, poverty rate and rural school locations were positively correlated with school closures, interactive and passive instruction, time spent in management, and off task behaviors. In general, interactive learning time was negatively correlated with urban poverty. Though these findings are preliminary and do not establish causality, they are in accordance with earlier research suggesting that the schools of the poor offer less instructional time to their students.

This study was implemented in only three countries and one state. It did not have a large sample of very low-income countries where textbook scarcity forces children to spend most of their time copying from the blackboard. Nevertheless, it has shown that under some circumstances the time and opportunity to learn are very limited. This phenomenon may account to some extent for the disappointing learning outcomes that the poor children show worldwide. Making better use of instructional time is key to achieving Education for All.

Thus, time is a mediator variable that has escaped scrutiny and measurement thus far. It is not enough to provide the ingredients of instruction and assume that they will be used in class. Students must get sufficient time to master the instructional objectives intended in specific subjects. Furthermore, inputs like teaching aids must be employed within the timeframe available to students, or they may not promote student learning. Other sources of systemic inefficiency exist, such as dropout, repetition, and high staffing costs. But these may be causes or effects of time wastage. If so, the time devoted to learning the material prescribed by the curriculum may be at the crux of educational "quality". The quantity-quality tradeoff that is often mentioned in relationship to rapid expansion of education in low-income countries may be mitigated if measures are taken to give students the instructional time they need, even as class sizes increase.

Equally important, instructional time loss has *budgetary implications*. A class hour in a particular school corresponds to a slice of a country's recurrent expenditure budget. In some countries only a small fraction of government and donor resources may be converted into learning activities. To ensure that government and donor investments have the expected impact, policy dialogue must focus on the processes needed to supervise and improve time use at all levels. Research on instructional time in low-income countries is very limited, but the scope is large. Issues with policy implications include:

- Monetarizing the losses and consequences of time loss, and adjusting economic indicators on this basis;
- Collecting data on the policies and practices that result in school closures, such as late teacher assignments, payment policies, class cancellations for impromptu training, cultural events, and lengthy exam preparation; developing effective action plans to minimize them in each country.
- Making principals explicitly accountable for keeping schools open and monitoring teachers' presence and classroom instructional time; establishing accountability with district staff who interface with them to monitor time use at the local and central levels;
- Ensuring that all students in all grades have textbooks that they can take home and use for homework and that are available during class to facilitate time use; informing

governments about the time use problems that arise when just a few textbooks are available for classes.

- Negotiating with and informing the teacher unions about the consequences of time loss on the poor, publicizing local-level linkages between time use and academic performance, exerting social pressure against political influence that enables non-performing teachers to continue drawing salaries.
- Specifically training teachers to use time well, particularly through dissemination of effective classroom management practices that can keep students occupied all the time; training principals and supervisors to recognize the major components of instructional time use with brief observations and to use this system in their work.
- Publicizing the cost of time loss at the local level and making communities aware of how well children's time is used. In particular sensitizing lower-income parents to the signs that show whether their school teaches efficiently and to the simple means they can use to ascertain whether their children learn basic skills (e.g., oral reading fluency).
- If feasible, structuring development policy lending disbursements against significant improvements in instructional time use.

Instructional time parameters as monitoring indicators. The instructional time parameters are useful for monitoring institutional performance and accountability. Well- managed schools should stay open the number of days that governments specify, have few teachers absent, and ensure that students of absent teachers are engaged in learning. Visitors should find school registries with numbers of days and hours per subject matter approximating those specified by the government. Reduced teacher absenteeism should constitute evidence of effective school-based management. Finally, time on task in class should constitute evidence of effective supervision by principals, inspectors, or supervisors. Additional work is needed to develop modular surveys that accurately and inexpensively estimate instructional time loss. The benefit may be worth the cost and effort. Measurements obtained in this study suggest that an overall 80% use of time could be used as a standard to attain for lower-income countries.

The effects of time use must be tested more extensively vis-à-vis learning outcomes. Much needs to be learned about the effects of time use on the delivery of curricula, on test scores and on reading fluency acquisition in the all-important early grades. Memory issues, such the rate and efficiency of consolidating new information need to be studied in relationship to the amount and distribution of learning time, in order to identify the activities that maximize long-term recall.

The future of the Education for All initiative may depend on how seriously governments and donors take instructional time wastage. Hopefully this research is only the beginning.

1. THE PEDAGOGY OF POVERTY

Slowly and laboriously the car traverses the sandy road to a small town two hours away from the capital of Niger, in search of schools built by a World Bank project. A newly constructed building appears ahead, and the Bank's evaluation mission eagerly approaches, but in mid-morning it is closed. Half an hour later another school appears, with several children playing in the yard. A teacher sees the car approaching and calls them inside. The mission enters a room with bare walls and a single textbook that is on the teacher's desk. Words in French are written on the blackboard, and visitors ask students to read them. Two students seem to decipher them, but when the same words are written elsewhere on the blackboard, they cannot. The teacher says that he was assigned to the school only a month before, and that the class had not functioned for several months.

A World Bank evaluation mission visits a school in rural Bangladesh. The school is closed when the mission arrives and opens an hour behind schedule. The principal explains that because of the rain, students could not walk out of their houses earlier. But only about 25% of the registered students finally arrive, and the classrooms clearly have no seating space for all those who are registered. It is because of the rain that students are absent, teachers say. Just yesterday, most of them were there. Probably tomorrow they will all be there again.

A researcher with a group of university students learning to conduct classroom observations requests permission to visit classes in a primary school of Pernambuco in northeast Brazil. Permission is granted, but when the team arrives in the school, they find no students or teachers. The principal explains that she misunderstood the request and thought that the building was needed for a function, so she canceled all classes for two days. The group then proceeds to a large secondary school in downtown Recife. They arrive in the first hour of the afternoon shift. The students noisily loiter the hallways because many teachers are late. Inside other classrooms students are talking to each other in groups, but it is unclear whether they are doing group work or just chatting. In two classrooms, teachers sit on the desk correcting papers, while secondary-level students (who receive no textbooks from the government) are copying math problems and language texts from the blackboard. In a school of about 12 classrooms, only one had a teacher clearly interacting with students on an instructional topic. After spending an afternoon in search of instruction to observe, trainees could hardly get any practice.

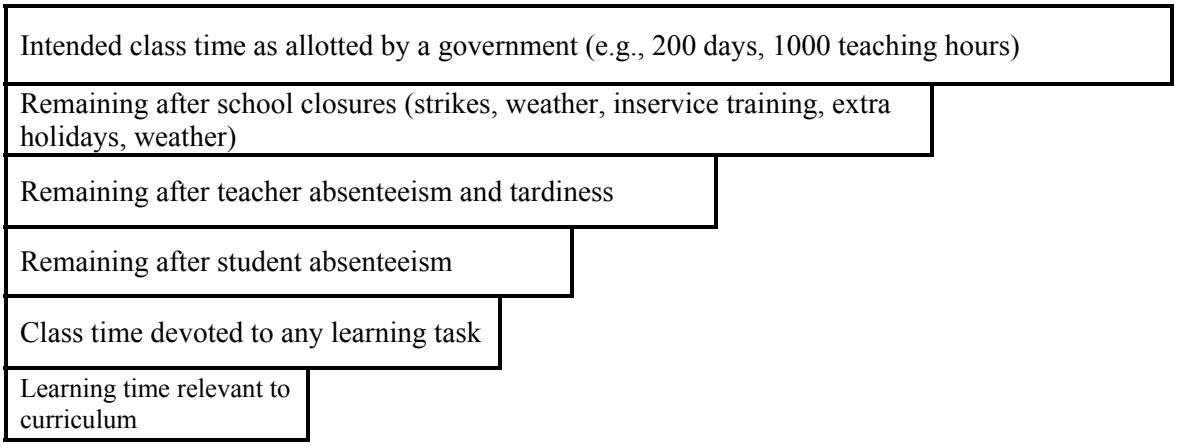
The Independent Evaluation Group (IEG), a semi-autonomous department of the World Bank in charge of evaluating completed projects, visits many schools and observes classes. Time use in many countries has been a cause for concern. Schools may close informally, sometimes for local functions. The school day may start late or end early for various reasons, and schools may be effectively operating for only 2-3 hours a day per shift. Teacher absenteeism is rampant, due to strikes, legal leave, departure to home towns before holidays, late arrivals and early dismissal of classes. And when teachers are in school, they may be chatting among themselves and abandon classes or allow inordinately long recesses. During class, much of the time may be spent taking attendance, handing out textbooks, doing small chores, and copying to and from the blackboard. As a result, public schools of low-income

areas may offer students just a fraction of the time governments and donors put at their disposal. The time wastage constitutes failure to deliver a basic service to the poor. [2]

A striking symptom of this failure in some countries is students' inability to read fluently (if at all) until the later primary grades. [3] Lacking parental support, poorer students tend to fall behind early and repeat grades or drop out illiterate. In middle-income countries like Brazil, poor time use means that some students are surrounded by piles of books that they cannot read. Performance is often worse in multilingual countries that must teach in official languages, particularly languages with complex spelling systems like English, French, and Portuguese; there is simply not enough time to teach the basics.

When and how is time lost? International studies have mainly focused on teacher absenteeism (Chapter 2). But absenteeism constitutes only one source of loss in the delivery of basic educational services. Students' opportunity to receive information and to process it is reduced in multiple stages. Sometimes the loss happens in large blocks, due to strikes or late teacher assignments. But time is frequently lost in small increments; a day here, an hour there. It is lost minute by minute when teachers fail to start work promptly in class, distribute textbooks, or leave the room to chat with others (Figure 1.1). Kids are often happy to have extra vacations or to get off school early, so no one may complain. However, they are the ones who ultimately lose the most; they may sacrifice current earnings to spend years nominally attending school and lose future earnings as well as social status if they lack the skills needed for the labor market.

Figure 1-1. Instructional Time Loss Model



The wastage of instructional time should be an important concern for those who finance education. Governments, donors, and parents pay for educational inputs, buildings, salaries, teacher training, textbooks, and materials in order to provide quality education. The financing is expected to translate into time and opportunities for students to learn, and it is commonly expected that 100% of the investments will be used for student learning. Thus, a class hour in a particular school corresponds to a budgetary fraction given the amount of time schools officially operate (for about 4-5 hours in about 200 days – see Chapter 2). The degree of budgetary wastage resulting from time loss has probably not yet been calculated.

2.World Development Report 2004.
3. IEG 2006.

Time wastage is rarely measured through all the stages in which it is lost, yet such measures are feasible. Unlike many educational measures, time is a well-understood concept that also has equal units and an absolute zero. It also offers the possibility of international comparisons. A variety of methods have been used to assess instructional time, and many studies have focused on specific stages of time loss. Measuring the multiple steps of time loss can be a complex undertaking. Documenting large blocks of time loss (such as strikes) may be easy, but measuring smaller amounts of time requires more intricate methodology.

The opportunity to assess an integrated model of time loss arose with a grant from the Bank-Netherlands Partnership Program for Global and Regional Initiatives (BNPP). [4] Research undertaken during this grant attempted to answer the following questions:

a) How much of the classroom time do students spend engaged in learning compared to the theoretically available time?
b) What is the relationship between the various measures of time use and academic achievement?
c) What policy options will improve use of time at central government and at local levels? And what costs and savings might be associated with better time use?
d) How can the amount of time spent on learning be measured in ways that are simple and easy to administer, reliable, comparable across countries and monitorable across time?

Rationale for IEG involvement. IEG had raised the issue of instructional time use repeatedly during Project Performance Assessment Reviews (PPARs) in many countries, but there was no easily usable methodology to permit a holistic measurement of time loss. The BNPP grant made it possible to develop it and study its feasibility. So the study took place in countries where PPARs had been conducted (Tunisia in 1998 and Morocco in 2001), as well as Ghana, which had been the focus of a 2004 impact evaluation. To pilot the use of instructional time data as a baseline for later project evaluation, the Brazilian state of Pernambuco was included in the study. An education project had been prepared and was about to become effective as the study started. In Pernambuco, supervisors were trained after data collection on techniques that would help increase instructional time in class. The effects on learning outcomes would be studied at project completion, around 2010.

Subsequent chapters provide the research background, results, and methodological challenges involved in the measurement of instructional time loss. A follow-on, more detailed study, also financed by the Government of the Netherlands, was under implementation as this document was being prepared.

4. A team of staff members (Helen Abadzi-IEG, Robert Prouty-HDNED, and Benoit Millot-SASHD) received a grant of US$227,500, that became effective on July 23 2003 and was completed on June 30 2005, after an extension of one year. The staff volunteered their time for this project and could only travel in connection to grant activities during trips undertaken for other purposes.

2. THE EFFECTS OF INSTRUCTIONAL TIME USE: A LITERATURE REVIEW

In the 1960s, some economically oriented studies examining the inputs and outputs of schooling in the US concluded that classroom events made little difference in the lives of children; the school was essentially a "black box" between the inputs and the outputs.[5] However, this view was challenged soon. An early model of school-based learning[6] conceptualized achievement as a combined outcome of two time variables: (a) the amount of time a learner is engaged in learning (i.e. the time a pupil is involved in learning tasks); and (b) an individual's learning rate (i.e. the amount of time needed for learning). Mathematical learning models also tried to show that optimal learning performance could be achieved by giving students sufficient time to learn.[7] It was understood that with sufficient time, students should retain what they practice and think about.[8] In the late 20th century, neuroscientific research led to a better understanding of learners' need for prolonged and repeated exposure to stimuli. The cellular process called long-term potentiation, for example, helps increase the strength of synaptic connections that result in learning.[9] Thus, the rationale for prolonged and distributed learning sessions with feedback and contemplation of the material rather than one-time exposure or mere "quality time" has been firmly established.

The instructional time concept (sometimes called "opportunity to learn") spurred a wave of research in the 1970s and 1980s in the U.S. Researchers[10] attempted to quantify and compare learning time in various instructional settings, and to measure loss due to disrupting factors (e.g., inadequate educational policies, poorly organized or delivered class lessons). Time loss was documented through classroom observation instruments (e.g. those of Stallings, Virgilio, and others). Concerns about using time well entered pre-service and in-service training during the 1980s, under mottos such as "Keep students occupied all of the time!" Classroom management techniques have been developed to help teachers control the class and use time well.

How is time spent in school? Primary school curricula can be classified into six subject areas: language, mathematics, natural science, social sciences, aesthetic education and physical education. These subject areas receive between 80% and 90% of overall instructional time during the first six years of schooling. On average, one-third of all instructional time in primary schools is devoted to language instruction; of this, about 25% of time is for national/official languages and 8% to foreign languages (local languages are infrequently taught). About 20% of instructional time is devoted to math. The mean instructional time devoted to the arts, sciences, physical education and the 'social sciences' (history and geography) is usually 10% for each subject area. Some systems may also include religious/moral education, hygiene/health education, vocational education/

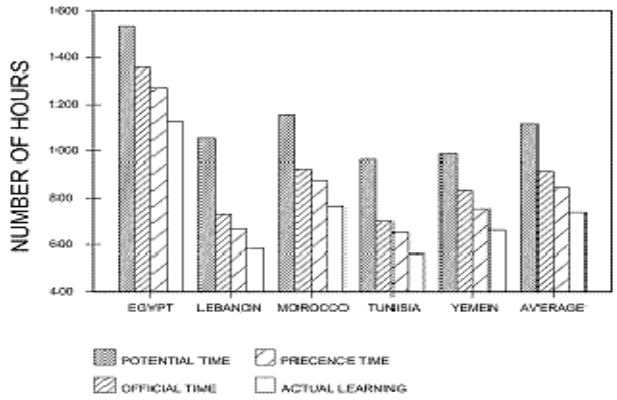
5. Coleman 1966, Jencks 1972
6. Carroll 1963
7 Atkinson 1972
8. Doyle 1983, Ben-Peretz and Bromme 1990
9. Rabenstein et al. 2005. See Abadzi 2006 for a review of neuropsychological issues, including feedback and memory consolidation.
10. For example, Smith 2000 and Wang 1998

practical skills.[11] In secondary education, the trends are similar. At the global level, instructional time is devoted to languages (30%), math, science, and computer technology (about 30%), and social sciences (about 13%). The remaining time is devoted to arts, physical education, vocational skills, and religious/moral education. In addition to academic subjects, middle-income countries and private schools may occupy students during lunch and offer extracurricular activities. For example, US elementary schools may only spend 65-70% of the day in teaching academic subjects.[12] (These extracurricular hours were taken not taken into account in this study.)

How much instructional time are schools expected to offer students? Students ought to go to school for the amount of time necessary to master instructional objectives in each grade. Education ministries define the number of days or hours that schools should function and teach specific material (Figure 2-1). Guidelines are typically found in the weekly timetables of various countries and in policy documents regarding the length of the school year, the school day and the class period. The 2005 UNESCO EFA Global Monitoring Report recommends 850 to 1,000 hours annually (aside from breaks and lunch periods), and the Education for All Indicative Framework expects at least 850 (or about 200 days at 5 days per week). [13] Several East Asian countries provide more than 1,000 instructional hours of teaching (documentation provided by the UNESCO International Bureau of Education). In terms of days, the length of the school year varies. In the early grades of primary education (grades 1-4), median instructional hours tend to be higher in the education systems of Sub-Saharan Africa, Latin America and the Caribbean, and Western Europe and North America. They tend to be lower in Central Europe and the former Soviet Union and, to a less extent, in East Asia and the Pacific and the Arab States.[14] In Pakistan and Nepal, the primary school year lasts for 180 days, rising to 190 days in Zambia, 200 days in Bangladesh, and 220 days in India. In terms of actual rather than instructional hours, the global mean may range from 705 hours in grade 1 to about 830 hours in grade 6.[15]

11. These curricular structures have remained remarkably stable between 1920 and 1985, but the proportion of instructional time devoted to 'modern' subjects such as mathematics, natural sciences and foreign languages has increased and the teaching of history, geography and civics as separate subjects has been reduced in favor of the more interdisciplinary 'social studies' (Benavot and Amadio 2004, Benavot 2006)
12. Perie et al. 1997; Roth et al 2003
13. UNESCO 2005; an instructional hour lasts 40-50 minutes or sometimes less (as in Ghana, where it lasts 30 minutes). Some data suggest 750 hours mandated each year in primary-school classrooms (Amadio 1998; UNESCO-IBE 2000). during the first 2 years of primary education countries mandate on average 710-740 hours of instructional time per year. Intended instructional time increases in each subsequent grade level and reaches approximately 900 annual hours in grade 8. This pattern translates into an average supplement of about 25 annual instruction hours per grade level, although these increases are not linear. There are significant jumps during grades 3-5, and then again between grades 6 and 7, when the transition between primary and lower secondary education typically occurs.
14. Benavot and Amadio 2004.
15.Benavot 2002

Figure 2-1. Instructional Time Indicators in Basic Education of Some Middle Eastern Countries



Sources: Amadio 1997, Millot and Lane 2002.

How efficiently can instructional time realistically be utilized? Curricular objectives are prescribed for coverage within specific timeframes, so the implication is that students should be engaged in learning 100% of the time. In addition, homework would supplement classroom time. In reality, it is impossible to use 100% in instruction; children and teachers will interact socially some of the time. Losses are limited in industrialized countries because they have reasonably effective administrative mechanisms to regulate school time and monitor teacher compliance. In these countries, the school year is implemented as planned, substitute teachers are called for absent teachers, and parents are attentive to students' progress. Thus, the school-level sources of time loss are near zero, and the challenge is to maximize time on task. For this reason, instructional studies in the US focus on how classroom time is used. Measures have varied broadly, with studies in the 1970s and 1980s showing on-task time from 38% to 96% of available time.[16] Time use has progressively increased. A longitudinal study of eight elementary schools in Chicago, for example, found that 85% of the daily allocated time was dedicated to instruction.[17] It may be difficult to exceed this efficiency rate, and this may be one reason why U.S. educators have lost interest in this concept since the 1990s.

Outside the industrialized countries, however, concerns have grown that curricula cannot possibly be covered in the amount of time students spend engaged in learning at school or even with private tutoring at home. Sources of 'leakages' may be multiple, and voluntary or imposed. Financial, cultural, and political events[18] reduce schooling time in ways that are rarely seen in industrialized countries. How much deviation from the 100% standard would still enable curricular objectives to be reasonably well achieved in various countries? No research has been found on this topic.

16. Smyth 1985; Anderson, Ryan and Shapiro 1989; Fisher et al. (1978) estimated that academic learning time in the US amounted to about two-thirds of total engaged time.
17. Smith 2000. Other studies of the 1990s are local and may not be published in peer-reviewed journals.
18. Millot, 1994, Millot and Lane 2002.

Though statistics may not be directly comparable, systematic surveys as well as ethnographic studies have shown surprising losses and highlight the issue of service quality to the poor. Some examples are:

Senegal. A study undertaken by the inspectors of the *Académie de Diourbel* found a teacher absenteeism rate of about 30%, with strikes initiated by both students and teachers. [19] In the final secondary grade and before the final examinations, almost five weeks of class time were lost between October and March. With a teacher absenteeism rate of 32%, the deficit amounted to 112 hours or about 14 weeks. In the philosophy course only 4 of the 23 chapters were covered, in physics 7 of the 17 chapters, and in chemistry 7 of the 11 chapters were covered.

Bangladesh. A 2003 ethnographic study of time use in eight low-income schools found that schools operated 19% to 55% fewer days than scheduled in the school calendar. The losses had multiple sources. One month of contact time with students at the beginning and at the end of the school year were sacrificed to administrative and non-teaching activities. Rural schools seldom opened at the expected time. They allowed travel time for non-resident teachers and gave a 1.5-hour break to students attending Koranic school, but did not stay open later. Inside the classroom, time was not used well, either. Teaching occupied on average 63% of the class time in the classes observed. (Lecturing occupied about 83% of that time.) Students also showed high absenteeism; only 43 to 67% of them were in attendance on the days of surprise visits. Teachers estimated that only about 50% of the children were very regular in their attendance. The study found that the problems were more prominent in isolated areas. However, schools were more likely to comply with schedules if they received regular visits by authorities. [20]

Dominican Republic. A USAID-financed team visited schools on three different occasions. It found that on average students were receiving instruction 77% of the time. Main reasons for time loss were various meetings of teachers with parents, district and other officials, and training (about 42%). Strikes accounted for 19% and teacher absenteeism accounted for 8% of the lack of instruction. Overall, schools used 65% of the intended time in teaching. Afternoon shifts spent less time in teaching (58%) than morning shirts (73%), a trend that was also shown in the Brazilian state of Pernambuco during the World Bank study (See Chapter 3).[21]

Mexico. A study from the 1970s showed that a typical teacher used about 50% of the scheduled school week on actual instruction. The rest of the time was lost to absences, leaving early, administrative interruptions, and classroom disturbances.[22]

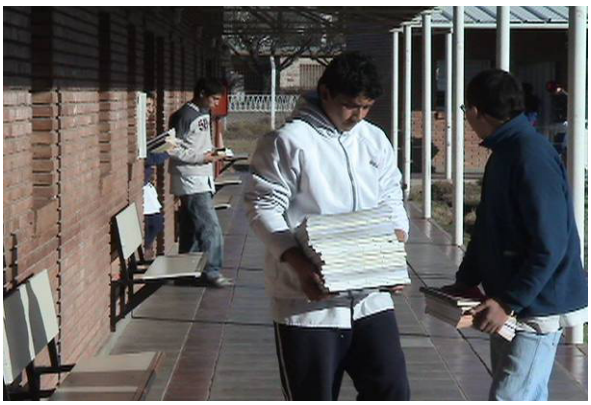
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19. Diouf 2005
20. Tietjen et al. 2004
21. EDUCA 2005
22. Munoz Izquierdo 1979. Other estimates with limited data include: In Colombia, off task time was estimated at about 40 percent (Arancibia 1987). One third of instructional hours might potentially lost because the teacher's voice is drowned out by rain on metal roofs in Malawi and less than half the prescribed time for the early grades may be taught in Indonesia (Lockheed and Verspoor 1992).

TIME LOSS AT THE SCHOOL LEVEL

In all countries, the school calendar consists of class days and scheduled holidays. Inevitably, some days will be lost due to unforeseen reasons, such as weather. In higher-income countries, schools are prepared for such events; for example, school districts in the U.S. may build into the school year four days due to snow buildup and extend the school year if snow lasts longer. Aside from using substitute teachers when needed, provisions are made to keep students occupied during periods of in-service training that is conducted during school hours. In lower-income countries, however, money for substitute teachers is rarely available, and school operation may be overridden at the local level. As a result, schools may operate fewer days than expected. Reasons include long matriculation periods, in-service teacher training, climatic conditions, and infrastructure in poor condition (e.g., severely leaking roofs or damaged walls that may make some classrooms unusable). In Mali, for instance, schools were found to function 70% of the official time.[23] In Honduras, schools were open 114 days of the official 200 in 2001.[24] Surveys in Nepal suggest that schools operate on average for three hours per day, a fact that halves the teaching time available from over 1,000 hours to just 540 hours.[25] In Burkina Faso, a minimum of 16% of the official allocated time was lost due to breaks and exam periods.[26]

Figure 2-2. Argentine students carrying textbooks from the library during class time



Source: Author; Iaccarini agricultural school, Mendoza, Argentina

In poorer countries, instructional time may also be lost also due to the inefficiencies involved in large classes that may exceed 100 students. To deal with large classes, countries like Senegal, Guinea, Bangladesh, Ghana or Niger split a class into two and divide the time. Thus, a school day of five periods may be reduced to three, and the number of instructional hours provided to students is curtailed. This is known as split-shift and results in a 32-42% loss of time (Table 2-1).[27] Some studies have reported that this policy did not significantly impact student performance,[28] but this finding may be due to an already low quality of education.[29] Evidence from Guinea and Burkina Faso suggests that the split-shift arrangement reduces time on task, particularly in the afternoon shift, and ought to have a

23. Kim 1999
24. OED 2004
25. Watkins 2000, p. 112
26. Dia 2003
27. Split-shifting is sometimes called double-shifting, but the interpretation is erroneous. Schools may operate double and even triple shifts and offer students all the expected instructional hours.
28. Bray 2000, World Bank and IADB 2000, p. 46
29. Linden 2001

negative impact on achievement.[30] For example, in Guinea, students from split-shift classes scored 3.6 percentage points lower in French and 5.6 points lower in math.[31] An additional consequence may be higher teacher absenteeism, since this scheme is demanding and repeating the same information to multiple sections may be tiring.[32] The original plans in some countries called for the "off-shift" students to be occupied with schoolwork outside the class. However, it has often been impossible to organize teaching during "off-shift" hours, and children typically just go home.

Multigrade teaching in low-income countries may also result in reduced instructional time.[33] In multigrade classes that are common in small rural schools, students are in school but get only a fraction of the teacher's time; if classes have no textbooks or students cannot read them, they cannot use their time productively when the teacher works with another group. Strategies to cover more students with fewer teachers or classrooms risk reducing the quantity and quality of instructional time available for pupils.

Table 2-1. Instructional Hours in African Countries Using "Split-Shift" Schooling

Type/ No. of hours annually	*Mali*	*Guinea*	*Senegal*	*Cote d'Ivoire*	*Burkina Faso*	*Average*
Standard Classes	888	747	675	754	858	784.4
Split- Shift Classes	645	585	547	580	603	592
% Difference	37.7%	27.7%	23.4%	30%	42.3%	32.2%

Source: Kim 1999. Amounts average for all grades

How does class size relate to instructional efficiency? The relationship between class size and student performance is complex.[34] Combined with meager school resources large classes adversely affect teacher recruitment, especially to posts in rural areas and create a vicious circle.[35] But even without splitting shifts, lowering mean class size has substantial costs and is not necessarily the most efficient strategy for increasing achievement. For example, an early study conducted in Malaysia revealed that lowering class size would raise student achievement by 1% but would cost US$50 per student.[36] In a study of primary schools in Israel it was found that increasing instruction hours and reducing class size had significant effects on students' achievements. It seemed more cost effective to increase use of available instructional time than to decrease class size.[37]

TEACHER ABSENTEEISM

Teacher absenteeism has been documented extensively.[38] Higher absence rates are predicted by factors at the community level (remoteness, parents' education level), teacher level (teacher's professional or age-related seniority), and management level (physical

30. Dia 2003
31. Barrier et al. 1998
32. Linden 2001; Suryadarma et al. 2004
33. Attar 2001, Njie 2001, EARC 2003
34. See Abadzi 2006 for a review
35. Onwu 1999
36. Beebout 1972, in Fuller 1987
37. Lavy 2001
38. Chaudhury et al. 2004b, 2004c; Jacobson 1991

infrastructure, multigrade teaching, inspection frequency). Absence rates decline as national per-capita incomes rise.

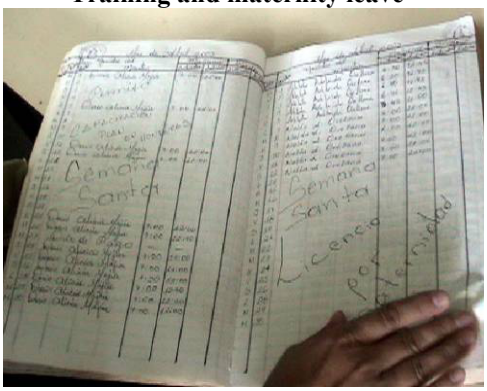
As Table 2-2 summarizes, absenteeism in primary schools ranges from 11% in Peru to 27% in Uganda. Losses can be large. For example, a study of schools in one region of Kenya found that teachers were absent from school 30% of the time.[39] An unpublished study conducted in a sample of secondary schools in Senegal reported that teachers were absent approximately 30% of the time.[40] An observational study of 120 schools in rural Ghana, reported that, on average, teachers attend schools four days a week, implying that 5.5 instructional hours are lost each week. On the day that researchers visited schools, almost one-fifth (19.4%) of the teachers were absent.[41] A recent survey of absenteeism in Indonesia found that out of those reported to be full-time teachers 21% were absent from school; 27% out of those who were not absent at the time of the interview were out of their class and only 53% of them were engaged in teaching activity.[42]

Teacher absenteeism studies in South Asia show similar results. A nationally representative survey of 3750 schools in India showed that 25% of teachers in government primary schools are absent at a typical point during a school day.[43] Absence rates ranged from 15% in Maharashtra to 38% in Bihar and 42% in Jharkhand. Another survey in Udaipur focused on 60 non-formal education centers run by a non-governmental organization and found teachers' absence rates of 36%.[44] The PROBE study in India, which was carried out in 234 randomly selected villages of Bihar, Madhya Pradesh, Rajasthan, Uttar Pradesh, and Himachal Pradesh in late 1996, found that one-third of the teachers were absent during research staff school visits.[45] Other surveys of primary schools in the Indian states of Uttar Pradesh and Madhya Pradesh found that 17% of teachers were absent from school and additional 20% were in school but absent from class.[46] Absenteeism among primary school teachers in West Bengal was 20%,[47] in Bangladesh it was 15.5%,[48] while in Pakistan, about 18% of public and private school teachers were, on average, absent from school.[49] Cross-sectional averages may mask the extent of this problem because in Pakistan the researchers found that 23.5% of primary school teachers were absent during at least one of the two visits.

39. Vermeersch and Kremer 2004
40. Diouf 2005
41. EARC 2003 (Educational Assessment and Research Centre)
42. Suryadarma et al 2004
43. Chaudhury et al. 2004b
44. Duflo and Hanna 2005
45. Public Report On Basic Education; De and Dreze 1999
46. Rao 1999; World Bank 2001
47. Sen 2002
48. Chaudhury et al. 2004a
49. Ali and Reed 1994. Subsequent research in rural Northwest Frontier and Punjab showed 14% absenteeism in public schools; in boys' schools teacher absenteeism was only 11% and in private schools it was 9% (Sathar et al. 2005).

Figure 2-3. Not all absenteeism is illegal; teachers may show up but not teach when expected

Training and maternity leave



Source: author

Teacher off task



- *Source: Barbara Bruns*

Why are teachers absent? Prominent stated reasons include teacher participation in educational workshops, in-service training sometimes lasting for several weeks,[50] personal problems, traveling to administrative centers for salary compensation, and casual leave.[51] Pregnancy and housework may affect female teachers.[52] Illness in general and HIV/AIDS in particular have become major causes of absenteeism in certain countries.[53] Some research links poor physical school conditions to absenteeism.[54] Another aspect of absenteeism is refusal to take up postings in desirable locations. For example, in Ghana, a significant number of newly trained teachers every year refuse posting to rural schools, and many of those who accept eventually will ask for a transfer to urban schools or quit teaching.[55] In some countries teacher appointments are given as political favors, and appointees may not be expected to teach.

However, the stated causes for teacher absenteeism often make the fact that the institutional environment does not really require teachers' constant presence.[56] At the root are limited authority by schools, lack of interest in enforcing sanctions, and the lack of parental involvement.[57] Absenteeism is often lower among female teachers, among teachers born in the district where the school is located, and among teachers of children whose parents are more literate.[58] However, few studies have explicitly explored the linkages between accountability and absenteeism. Longitudinal research is needed to establish cause-effect relationships and ferret out the conditions and mechanisms that inhibit or promote teacher absenteeism.

50. Fairhurst et al. 1999; Dia 2003
51. EARC 2003
52. El-Sanabiy 1989
53. World Bank 2002
54. OED 2004.
55. EARC 2003; the study reported teacher attrition, 12.5% of the overall school staff.
56. Rogers et al. 2004
57. King and Ozler 2001; Lockheed and Verspoor 1992
58. Chaudhury et al. 2005, OED 2004; Lewis and Lockheed 2006.

Figure 2-4. Call for a strike of indefinite duration in Argentina



Source: Author, poster in Rio Negro department of education

Teacher unions and the strikes they proclaim account for various amounts of time loss worldwide. The conflicts between governments and the teachers unions may affect student performance. In Mexico it was found that union power is associated with test outcomes; while low and high influence of unions was not significant, medium power was found to be significant and had a relatively large negative effect.[59] In Argentina, adversarial political alignments were associated with a decrease in effective numbers of class days, with an indirect negative effect on student performance in Argentina.[60]

Private schools for the poor. The threat of prolonged teacher strikes and other forms of absenteeism drives parents to send children to private schools. (Many teachers also send their own children to private schools.) This is one reason why private schools for the poor have sprung up in the low-income areas of countries such as India. They often operate in squalid buildings and charge very little. Since they often operate without a license, authorities may not know about them. But visitors have found teachers present and students who seem engaged. This phenomenon has received attention and engendered calls to promote private schools and support them. Clearly, accountability to paying parents encourages the school owners to maximize instructional time, and thus improve students' performance.

Table 2-2. Provider Absenteeism Rates by Country and Sector

	Absence Rates (%) in:	
	Primary Schools	***Primary Health Centers***
Bangladesh	16	35
Ecuador	14	--
India	25	40
Indonesia	19	40
Papua New Guinea	15	--
Peru	11	23
Uganda	27	37
Zambia	17	--

Source: Chaudhury et al. 2004c; calculations are from facility surveys, except for Papua New Guinea (NRI and World Bank 2003) and Zambia (Das, Dercon, Habyarimana, and Krishnan 2005).

59. Alvarez et al. 2006
60. Murillo et al. 2002

Teacher tardiness. Data on this issue are limited. For example, a survey of Ghanaian primary schools reported that in addition to the 20% of teachers who were absent from school on the day of the survey, another 29% were late in arriving at school.[61] The report concluded that as a result of teacher absenteeism and tardiness, actual pupil-teacher interaction time was estimated to be only 70% of available instructional time. Reasons for tardiness are unclear and need to be better understood.

Absenteeism effects on student performance. Teacher absenteeism is particularly costly to the poor, since they cannot afford private tutors to cover the curriculum and pass high-stakes examinations. Thus, it has been related to lower student test scores in primary schools.[62] One study showed that a 5% increase in the absenteeism rate of teachers who stayed with the same class for two years reduced student gains by 4-8% during the year; the size and precision of these estimates was the same for both math and English.[63] In an Indonesian study, higher teacher absenteeism was related to lower fourth-grade student achievement on math (but not dictation) after controlling for household characteristics, teacher quality, and school conditions).[64] Absenteeism among teachers also encourages similar behavior among students, notably in countries such as Mali and Somalia.[65]

But the relationship between teacher absenteeism and student performance is not always clear. Some studies find either a weak effect or no effect between teacher absence and student attendance and test scores.[66] A study of primary schools in Pakistan found a 10% absenteeism rate but no correlation between teacher absence and achievement levels.[67] Another study in the Northwest Frontier Province of Pakistan[68] found that higher rates of teacher absenteeism increase student promotion rates for a given level of test scores but reduce student continuation rates. The explanation is that assessments of pupils' progress by absent teachers are less accurate, but students may not know enough material to continue, even if promoted. However, many studies rely on self-reports and are descriptive. The effect of teacher absenteeism on student achievement needs to be clarified with studies that have robust experimental designs.

USE OF CLASSROOM TIME (TIME ON TASK)

Ideally, students should be engaged in learning during the entire time they are class, but this is often not the case. School-based surveys of teacher activity carried out by PROBE (Public Report on Basic Education[69]) researchers in four Indian states found that in only 53% of the schools visited by the research staff were teachers actually teaching in their classrooms. The survey found that in 21% of the surveyed schools teachers were just "minding the class"; in 18% of the schools they were talking with other teachers; in 11% they were sitting/standing outside the room; in 7% they were in the head-teacher's room; and in 23% of the schools teachers were observed in other non-teaching activities. Similarly, an evaluation by the

61. EARC 2003
62. Suryadarma et al 2004, Chaudhury et al 2004a
63. Das et al. 2005
64. Study cited in Lewis and Lockheed 2006, p. 67.
65. Lockheed and Verspoor, 1992; EARC, 2003
66. Ehrenberg et al. 1991, Chaudhury et al 2004b
67. Reimers 1993
68. King, Orazem, and Paterno 1999
69. De and Dreze 1999

Independent Evaluation Group (IEG) of the World Bank in Brazil found fewer instructional activities carried out during school visits in lower-income states (Table 2-3). About 92% of the activities in the higher-income state of Goias focused on basic skills acquisition in comparison to only 35% activities in Ceará.

Table 2-3. Classroom Activities during an IEG Mission Visit in Brazil (2002)

State	*Ceará*	*Rio Grande de Norte*	*Alagoas*	*Goias*	*São Paulo*
Copying	6 40%	6 33%	2 22%		8 (2 secondary) 17%
Text production	1 7%	3 17%	3 33%	4 28%	2 4%
Reading lesson in class	2 13%	1 6%	1 11%		1 2%
No activity	1 7%	5 (2 waiting for bell) 28%	1 11%		8 17% (some teachers absent)
Teacher busy with 2-3 students only	1 7%		1 11%		4 8%
Teacher teaching whole class	2 13%	1 11%		6 43%	10 22%
Group practice	1 7%	2 11%		3 21%	4 8%
Art and Play	1(scheduled activity) 7%	1 (play with letters) 6%	1 (play with letters) 11%	1 (drawing) 7%	8 (during subject matter) 17%
No. classes	15	18	9	14	45
No schools	8	6	7	5	8
Apparently instructional activities (some suboptimal)	34%	45%	48%	92%	40%

Source: OED 2002

The scarcity of school resources, such as textbooks, and the presence of unqualified teachers (especially in rural schools) often result in reductions in classroom time.[70] A comparison of classroom instructional time in three Latin American countries found that Brazilian students spent significantly more time copying instructions than Chileans and Cubans. Few Brazilian schools used prepared activities, instead requiring students to copy math problems from the board before beginning work; test scores tended to reflect these differences.[71] In the Gambia and Burkina Faso, a large amount of time was lost writing lessons and problems on the board, because students lacked access to textbooks.[72] However, students must know how to read and understand the textbooks in order to learn. A study on a Kenyan program where an NGO provided textbooks to all pupils found improved used instructional time in classrooms, but test scores did not improve.[73]

Other things being equal, time on task distinguishes between students who learn a lot about a subject and students whose learning gains are modest. Some teachers are willing

70. Attar 2001; Njie 2001
71. Carnoy, Gove, and Marshall 2004
72. Dia 2003
73. Glewwe et al. 1999

to spend more time with students, and differences across classrooms may be striking, particularly for children with low initial reading scores. For example, in OECD countries, some first-grade teachers spent as little as 43 minutes on language arts while others devoted over 104 minutes per day. Extrapolating to an academic year, some children received as much as 180 more hours of instruction in language arts compared to other children.[74] Similar results were seen in a Peruvian study, where some low-income schools taught much more reading than others.[75] Clearly, engaging students as much as possible on learning tasks is a hallmark of teacher quality. And engaging students in activities that are more conducive to subsequent recall and to the formation of linkages among pieces of information is another important feature of quality.

U.S. research in the 1980s found that *corrective and immediate feedback*, attention to and transfer of prior learning, and the teacher interaction with students were important factors affecting achievement.[76] Specifically, the following relationships were found between time use and classroom activities:[77]

- more time spent on discussion and review ($r = +0.40$);
- more time spent reading aloud ($r = +0.59$); and
- more supportive, corrective feedback from the teacher ($r = +0.50$).

Activities found to be negatively associated with reading gains were:

- more time spent in silent reading ($r = -0.23$);
- more time spent in sustained silent reading ($r = -0.52$);
- more time on classroom management ($r = -0.24$);
- more time spent by the teacher on organizing activities ($r = -0.52$);
- more time spent by the teacher on social interactions ($r = -0.52$); and
- more time spent on negative interactions ($r = -0.29$).

Time use in class is partly related to subject matter and need to pay attention. Yair (2000) gave students in the US watches that beeped at random times, during which students reported what they were doing. He found that the gap between allocated and productive instructional time is significantly larger among minority students. Students reported engagement in lessons only 55.4% of the time; 62% in grade 6, and 47% in grade 12. Disengagement increased with age and absorption in other activities. Math held their attention 63% of the time, reading 55%, lab work 74% of the time, group work 70%. Boys were engaged 21% more than girls and blacks were engaged 29% less. Relevant and challenging materials held the attention more than boring materials. Teacher-centered methods that demand greater 'pan-optical' control got less engagement. Thus, research suggests that students may be more engaged in hierarchically oriented courses (such as science) that demand prior knowledge than in courses where prior knowledge is not needed. Thus, the preponderance of continuous lecturing that requires little response from students may result in low rates of instructional time.

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74. Kelly 2003. OECD is the Organization for Economic Cooperation and Development.
75. Crouch et al. 2005
76. Quartarola 1984
77. Stallings 1980

Greek research suggests that the weaker students are off task more often than the better students. The better students in a class were engaged in learning 76% of the time, average students 73% of the time, and weaker students 57% of the time. Off task time (absentmindedness, social interaction) amounted to 9.7 minutes for the better students, 10.8 minutes for the average students, and 17.4 minutes for the weaker students.[78] This research suggests that the students who are more knowledgeable can construct knowledge networks more efficiently.

TIME SPENT LEARNING PRESCRIBED CURRICULA (ACADEMIC LEARNING TIME)

Ideally students should not just be engaged in any learning activity, but should spend their time in activities that teach the prescribed curriculum. However, the degree to which this happens in lower-income countries is uncertain. Little systematic information exists regarding the amount of time schools actually spent presenting new material and progressing with the specified curriculum. Empirical information suggests considerable deviation. For example, in Ghana, a large portion of rural schoolteachers did not follow the prescribed weekly timetable.[79] This may happen because the teacher is not keeping a good track of the time that should be spent in various topics throughout the year or does not know certain topics well, such as math. Also teachers teaching multiple sections may be confused and present topics that have already been covered.

Teachers in low-income areas often do not know how much time to devote to certain topics or how to budget their time throughout the year. Teacher training and supervision rarely focuses on the use of allocated time or on planning to ensure that curricula are covered during the year. One means for doing so is giving teachers curricular calendars to help them easily visualize where they should be and to prevent classes from falling behind.

Students who learn the prescribed curriculum are most likely to score well in achievement tests, so academic learning time may be a more useful predictor of learning outcomes than mere engagement in learning activities.[80] However, measuring the time spent teaching the relevant curricula may be most advantageous to middle-income countries that already use time well in class and need feedback for fine-tuning. In lower-income countries or areas, just increasing the instructional time devoted to the curricula of any previous grade might improve learning outcomes.

RELATIONSHIPS BETWEEN INSTRUCTIONAL TIME, POVERTY, AND ACHIEVEMENT

Due to the issues discussed above, the schools of the poor may have less time for their students. US studies have found socioeconomic differences in the amount of time students spend learning to read, with classroom interruptions and disruptions a salient problem in schools attended by pupils from low-income families.[81] One longitudinal study found that high socioeconomic status students engaged in writing, reading and

78. Matsagouras 1987.
79. EARC 2003
80. http://education.calumet.purdue.edu/vockell/edpsybook/Edpsy2/edpsy2_intro
81. Stevens 1993

academic discussion 5% more time per day than poorer students.[82] The study estimated that students of low socioeconomic levels would need to attend school 1.5 months during the summer break in order to attain an equivalent amount of engaged learning time. Wastage adds up over the years and creates risks for poorer students.

Although research has been ex post facto rather than experimental, the relationship between instructional time and student achievement has been consistently positive.[83] For example, an extensive review of U.S. studies concluded that other things being equal, the amount learned is generally proportional to the time spent in learning.[84] Variables measuring curricular exposure are strong predictors of test scores[85] and correlations between content exposure and learning are typically higher than correlations between specific teacher behaviors and learning.[86] These positive relationships have been fairly consistent in studies employing different analytical perspectives, measurement strategies and units of analysis.[87] Two comprehensive reviews of research on learning effects demonstrated the positive influence of time on learning and the increasing precision in defining it: in an earlier review of 35 studies positive effects were found in 30 (86%) of the cases; in a later review of more than 100 studies positive influences were seen in 88% of the studies.[88] The association between time and learning was weakened only when other classroom factors were controlled, such as student differences in aptitude and prior knowledge, differences in the quality of classroom instruction and morale, or properties related to pupils' socio-economic environments.[89]

Research outside the U.S. has been sparse. More instructional time spent on general science was associated with higher academic achievement in Iran, India and Thailand.[90] Increased pupil reading time had a positive effect on pupil achievement in Chile and India. School-based instructional time was found to be especially significant for children who got little school academic engagement after school hours.[91] Instructional time was found to be one of three major areas (in addition to teacher quality and textbook availability) in which consistent achievement effects were obtained.[92] In a review of 14 studies involving instructional time in developing countries, 12 studies showed a positive relationship between instructional time and student achievement. Another study examined the influence of a variety of active learning methods and found instructional

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82. Greenwood 1991
83. Bloom 1971; Fisher and Berliner 1985; Gettinger 1984, 1989; Rosenshine 1979; Walberg 1988; Wang 1998; Wiley and Harnishfeger 1974
84. Frederick and Walberg 1980,
85. Content exposure was the most significant predictor of written test scores after everything else was controlled, while quality of instructional delivery was the most significant predictor of hands-on test scores. Further, students' attendance rate, content coverage, content exposure, and quality of instructional delivery are significant predictors of students' achievement test scores. (Wang 1998, p. 150)
86. Rosenshine 1979
87. Huyvaert 1998
88. Walberg and Fredrick 1991
89. Walberg 1988; also Worthen et al. (1994) found that the learning effects of increased time may be overstated.
90. Heyneman and Loxley 1983. In rural India student achievement was higher in schools with more instructional time; schools teaching the highest number of hours reported 66 more hours per year than schools with lower achievement (World Bank 1997).
91. See Suryadi, Green and Windman (1981) in Lockheed and Verspoor 1992.
92. Fuller and Clarke 1994

time to be a consistent predictor of pupil performance.[93] In the Philippines and Ethiopia more pupil-oriented teacher behavior led to improved use of time devoted to learning and had a significant impact on learning processes and resulted in higher achievement levels.[94] But studies have not captured all of the important dimensions of time loss and gain in lower-income countries, so the magnitude and significance of the relationship between instructional time and educational achievement may seem uncertain.[95] For example, in Pakistan it was found that teaching time by itself was a poor predictor of student achievement, and that the effective use of time was a more accurate predictor.[96]

Reduced instructional time may be related to higher dropout rates. For example, in Egypt girls attending multiple-shift schools with fewer instructional hours were five to six times more likely to drop out before completing lower secondary education than girls attending a single-shift school.[97]

Figure 2-5. Time lost in book distribution in Honduras



Source: author, rural school 2003

Tutoring. To make up for instructional time lost to strikes, absenteeism, and lack of feedback parents have resorted to private tutoring. This is a major phenomenon worldwide that has grown dramatically in recent times and has affected the priorities of those who tutor. Families with the necessary resources are able to secure not only greater quantities but also better quality of private tutoring. Children receiving such tutoring are then able to perform better in school, and in the long run to improve their lifetime earnings. However, children of low-income families often do not receive such benefits and may drop out of school at an earlier age.[98] This is one more way that the better off get more instructional time than the poorer students.

The association between instructional time and achievement lead some educators to argue in favor additional hours and a longer school year. In higher-income countries, the length of the year may not greatly affect performance (for example, Japan has 210 school days and Taiwan only 180). But poor students with language delays may benefit from longer instructional days when used well. Some countries (notably Uruguay) have "full-time" schools that keep students for about eight hours and offer many enrichment activities. Low-income students in Uruguayan full-time schools were 10% more likely to get

93. Armitage et al. 1986, in Fuller 1987
94. Tan, Lane and Coustère 1997; Verwimp 1999
95. Anderson 1976; Karweit 1976, 1983
96. Reimers 1993
97. Lloyd et al. 2003
98. Bray 2006

passing scores in grade 3 over those attending regular schools.[99] However, the effect is modest and suggests that merely increasing the time students are in school may have limited effects[100] without an increase in the time students are actually engaged in learning.

Overall, the instructional time received by students in the developing world is reduced appreciably due to various conditions and forces. While some of these factors are episodic in nature, others are structural with long-lasting effects.[101] Other factors come to play besides stark time use, such as the elaboration of concepts by students and the memorability of activities undertaken during the learning sessions. Nevertheless, cognitive research would predict that students elaborating concepts for a longer period would remember it better than students covering more concepts for shorter periods. Thus findings underscore the importance of effective time use in lower-income classrooms, especially through introducing more interactive instructional methods that enable students to "contemplate", analyze or synthesize the subject matter. It is important to obtain detailed data about the incidence of all these factors and focus country dialogue maximizing the use of effective time.

99. Cerdan-Infantes and Vermeersch 2007). Full-time schools in Uruguay cost 60% more than regular schools and offer students extracurricular activities rather than extra instruction (OED 2005a).
100. Karweit 1985
101. Millot and Lane 2002

3. INSTRUCTIONAL TIME DATA COLLECTION AND FINDINGS

A grant from the Bank-Netherlands Partnership Program for Global and Regional Initiatives (BNPP) offered the opportunity to compare time use in countries with different socioeconomic indicators in in 2004-2006. The first step in conducting an instructional time study was to search for innovative assessment methods and for experts knowledgeable about classroom observations and time use.[102] A research design was developed with the help of the UNESCO International Bureau of Education (IBE), an institution that has curricular expertise and keeps a database of the hours countries spend in teaching various subjects. Then countries where IEG evaluations had been recently undertaken were contacted through World Bank task managers and were invited to participate in the study. Also some countries were invited where a new project was being appraised in hopes that baseline data would be collected. [103]

The countries that showed an interest in carrying out studies were Tunisia, Morocco, Ghana, and the Brazilian state of Pernambuco. To build capacity, and test the feasibility of the methods, the surveys were not administered by private companies or consultants. Instead, Ministries of Education in each country agreed to train and use local government staff and carry out interviews and observations on a representative sample of schools. The Tunisian *Centre National de l'Instruction et des Recherches Educatives* (CNIPRE), and the Moroccan *Direction de l'Evaluation, de l'Organisation de la Vie Scolaire et des Formations Interacadémiques* extensively collaborated with the Bank (See Annex A for methodological details).

Methodology. Efforts were made to develop a measurement method that would cost relatively little, be administered fairly quickly, and capture time loss from multiple sources. Studies on teacher absenteeism have relied on multiple visits to samples of schools. To keep costs low and implementation simple, the study made a single unannounced visit to the sampled schools and compared information on time loss parameters from multiple sources: (a) Recall and self-reports by principals, teachers, students, and parents, (b) school-level observations, and (c) classroom measurements of time use. Surveys were developed and piloted to obtain self-reports and school-level observations. Classroom-level observations were obtained through a quantitative instrument that registered the amount of time spent in various common classroom activities. It also recorded the percentage of students who appeared not to be paying attention to the instruction (off-task rate). This measure estimates

102. The team sought the advice of Jane Stallings (retired dean of education at Texas A&M and a pioneer in instructional time measurement), Stephanie Knight, Eugene Schaffer (professors and Texas A&M and the University of Maryland in Baltimore county respectively), David Markham (retired systems engineer), the members of an International System for Teacher Observation (ISTOF), and the World Bank Development Economics Department (DEC) that has carried out teacher absenteeism studies.
103. The Independent Evaluation Group conducts qualitative evaluations on a sample of completed projects that are called Project Performance Assessment Reviews (PPARs). Initial plans included Guinée and Cambodia. Staff from Cambodia received training in instructional time assessment for use at a later time.

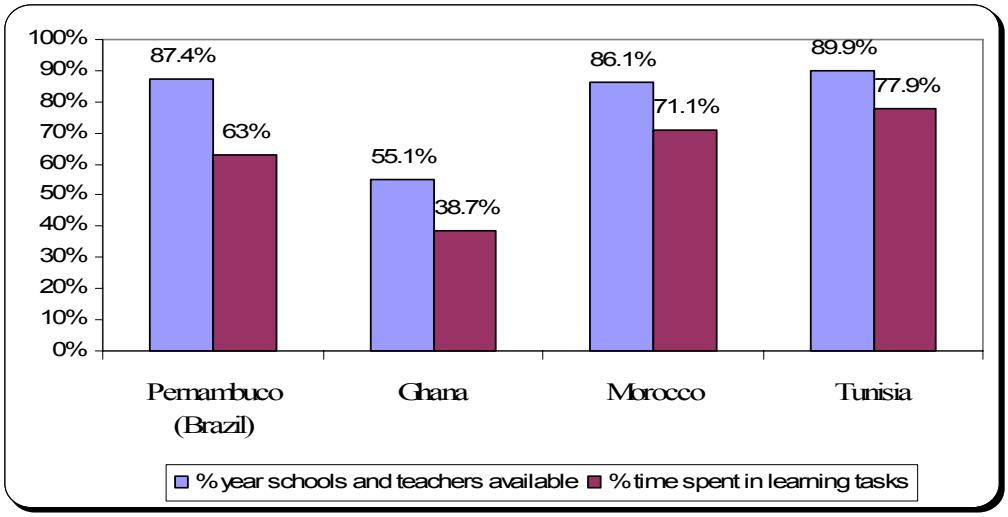
the number of person-minutes wasted in a class (e.g. 50 students unengaged for 20 minutes).[104]

Observed time loss was projected through the entire school year, taking school days and holidays into account. Repeated observations in a random sub-sample of schools of Pernambuco about 1.5 year after the first observation showed that overall time loss parameters were stable. (See procedures and analysis details in Annex A.) Overall, information from the different informants in schools was consistent, and time loss estimates could be averaged during analysis.

How Much of the Intended Time Was Spent on Learning Activities?

Instructional time losses varied by country. In Tunisia, the country with the most efficient use of time, students were engaged in learning 77.9% of the available time. In Ghana, however, students were engaged in learning only 38.7% of the time, and in Pernambuco 63% of the time (Table 3-11, Figure 3-1). Morocco had indicators somewhat lower than those of Tunisia (71.1% use of time for learning), but school closures and teacher delays were apparently underreported. Translated into number of days effectively available for learning, losses are palpable. For example, only 76.3 days were devoted to learning tasks of the 197 officially available to Ghanaian students, while for Tunisian students 148.1 of the 190 days officially available were devoted to learning tasks. In effect, Tunisian students get twice as much of the intended classroom time as Ghanaian students.

Figure 3-1. Percentage of time lost at the country level



Time loss varied among schools within countries. In Tunisia, Morocco, and Pernambuco, most of the schools sampled seem to have experienced relatively few school closures, most teachers seem to arrive at school on time, and they are rarely if ever absent or late. Reports of early departures were rare. However a few schools reported high closures for various reasons (climate, structural issues, or teacher strikes) and skewed the averages, while some teachers

104. This has been shown to be related to learning outcomes and has been sometimes used as a proxy variable in studies (e.g. Stallings et al. 1979).

had inordinately high rates of absenteeism. For example, about 85% of Tunisian teachers report few if any absences, but about 15% have missed much of the school year (reportedly due to illnesses and pregnancies.) Data from Pernambuco showed different absence rates according to the day of the week. There was 55% more absenteeism on Monday (4.79% of teachers) than on Thursday (2.69% of teachers). Also afternoon and evening shifts showed greater losses than the morning shift.

Table 3-1. Instructional Time Use in the Four Countries of the Study

	Pernambuco (Brazil)	Ghana	Morocco	Tunisia
School Year (Days)	200	197	204	190
School Closures (Days)	4.79	3.17	1.38	5.15
Days after Closures	**195.21**	**193.83**	**202.62**	**184.85**
Teacher Absence (Days)	12.76	43.01	13.36	11.55
Teacher Delays	5.50	39.75	6.94	1.27
Early Class Dismissals	2.31	2.43	6.68	1.22
No. days schools operated	**174.65**	**108.6**	**175.6**	**170.8**
% Year available for teaching	87.3%	55.1%	86.1%	89.9%
Engagement Rate in Interactive or Passive Classroom Tasks	72.1%	70.2%	82.6%	86.7%
School Days Devoted to Learning	**125.9**	**76.3**	**145.1**	**148.1**
School Year % Spent Engaged in Learning Tasks	**63.0%**	**38.7%**	**71.1%**	**77.9%**
Student off Task Rate	19.3%	21.1%	9.2%	9.9%
Instructional Efficiency Given Off-Task Rate	50.8%	30.5%	64.6%	70.2%
Student Absence (Days)	7.82	9.04	4.30	3.35
Student Delays (Number of Times)	5.64	10.61	5.187	2.63

How satisfactory are these results? Comparable indicators for this level of detail are almost nonexistent. US indicators ranged from 39% to 96% in the 1980s and to 85% in 2003 (Chapter 2). However, they mainly measure time use in the classroom and are not really comparable. As more data are collected in other countries, the range of the time loss parameters will be understood better.

HOW OFTEN WERE TEACHERS ABSENT OR LATE?

Teacher delays and absences (legitimate or otherwise) resulted in about 11.5-43 days lost during the school year. The number of days schools were closed for various reasons during the school year was reported as low, from 1.4 day in Morocco to 4.8 days in Pernambuco. But no details were asked about the timing of closures or about partial cancellations of classes, so the figures may be underestimates.

Teacher delays. It is not sufficient to show up at school, teachers must also teach. About 15.4% of Moroccan teachers were observed to delay entering their class by about 8 minutes. If this delay is consistent across classes, it constitutes 2.4% of the time broadly lost or 4.91 days of the 204 in the Moroccan school calendar. In Pernambuco, observers also found 12% of the teachers (5% in the 40-school sample) outside the classes during class time (half were chatting). Tunisia and Ghana did not explore whether teachers were inside classrooms.

Present but not teaching... The Moroccan enumerators observed that 15.4% of teachers were late by 7.8 minutes in entering the class. If this delay is consistent across classes, it constitutes 2.4% of the time broadly lost or 4.91 days of the 204. In Pernambuco, observers of the Pernambuco survey found 12% of the teachers (5% in the 40-school sample) outside the classes during class time (half were chatting). Other countries did not ask this question, which has generated in other countries concerns about teaching avoidance. However, a 2003 USAID study in Ghana found that on the day of school visit, 25% of the teachers were present but not teaching. After missing school for about 20% of the time, 9% of the time left is lost to student abandonment. [105] The study estimated 8.25 hours lost per week in the mainly rural and periurban communities of the sample.

Assigned to a school but not teaching…. In several countries teachers may be assigned to schools where they do not teach, often as a political favor (Chapter 2). This survey did not ask the schools how many teachers were assigned to them vs. how many teachers were actually expected to show up every day. However, the Superintendency of Pernambuco found at the time of the survey large numbers of teachers with fewer assigned hours of classes. There were also teachers who were on various types of leave, others who had been seconded to schools of their liking, and some who had effectively abandoned the public schools. For example, the district of Barrentos showed that 175 of the 459 teachers (38%) missing, while Sertão de San Francisco had 40% of the teachers missing. In addition some "substitutes" were found who had been illegally contracted by teachers to teach in their stead. Principals were often cognizant of the problem and assented. In addition to the salary wastage, training becomes impossible since it is unclear who teaches in various schools. Teacher unions complain when actions are taken against absent teachers, and conflicts are frequent.

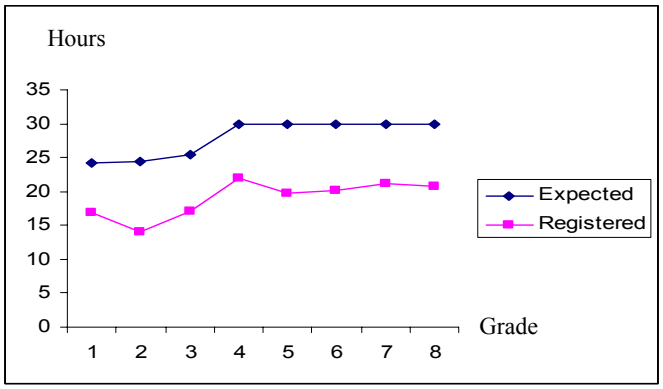
Poor record-keeping and potential under-scheduling. A detailed examination was available only from a sample of 40 schools in Pernambuco. Enumerators found absences in 88% of the school registries. They also found that 74% of the teachers' log books (livros de ponto) were either missing or were not filled out (Figure 3-2). One reason is the limited interest in these log books. Teachers reported that in 62% the registries are reviewed by the principal and 32% just by the secretary. Principals interviewed mentioned that they are not really responsible for teacher absenteeism, they just report it.

In the 26% of the registries that were filled, the number of student hours that should be taught was lower than expected, particularly in the Portuguese language classes where more than half the times the amount of time students should have studied was missing; of

105. EARC 2004.

23.1 hours that teachers ought to be teaching in grades 1-6 in Pernambuco, they were registered to teach only 17 hours. It was not possible to ascertain whether empty registry entries signified failure to document or failure to teach. But some of these teachers may have been scheduled for fewer hours of instruction, as found out by the Pernambuco Superintendency office. This tendency is a pattern also found in other countries, such as Indonesia.[106]

Figure 3-2. Expected and registered number of hours taught in Pernambuco



Ghana did not provide data on the use of class and school registers. However, the USAID study in 2003 reported that 97-99% of the classes had registers and several were using them effectively.

Roll call. In all classes, a significant amount (maybe up to 10 minutes) can be taken up by calling the names of students to check presence. If this is done every day, then up to 8% of class time (about 16 days per year) may be spent in this task.

WAS THERE RECUPERATION OF CANCELED CLASSES?

When asked how often remediation takes place or what activities are done when teachers are absent, responses are contradictory. Teachers in Pernambuco mentioned that in 80% of the days there are substitute activities, but only 60% of the principals mentioned this option. The principal or another teacher may take a class, but substitute teachers in Pernambuco seem to be used only in about 17% of cases. Fewer than 50% of classes lost are recuperated, and the number is uncertain.

In Tunisia findings were similar. Although principals stated that they usually have substitute teachers (Table A-12), teachers stated that students generally go home (Table A-13).

106. also see Millot and Lane 2002

Table 3-2. Solutions adopted by Tunisian and Moroccan principals during teacher absence

	Tunisia	Morocco
Use a substitute teacher	74.5%	58%
Send the children home	52.9%	Not asked
Distribute them to other classrooms	29.4%	72%
Keep them in their classroom	21.6%	Not asked
Principal teaches the class	17.6%	Not asked
Other arrangement		3%

WHAT POLICIES WOULD INCREASE TEACHER ATTENDANCE AND PUNCTUALITY?

The reasons for teacher absences, self-reported or reported by principals typically involved illness, pregnancies, family events, and training. There was little difference between men and women in this respect. Ghanaian teachers often reported distance and the need to collect salaries from town as a reason for missing classes.

Teachers were asked for suggestions to decrease absenteeism and delays. They proposed salary increases and government compliance with its own rules about absenteeism. For example, Brazilian principals and teachers suggested that absenteeism would be reduced through: (a) Salary increases (over 70% of teachers), (b) sanctions or punishment of absent or late teachers, (c) assigning teachers to schools near their homes and (d) help for new teachers. Principals thought that better communication with district offices (60%) might help.

In Ghana, existing measures already include salary deduction of the hours absent, regular and effective monitoring by head teachers and circuit supervisors, district disciplinary committee in the enforcement of teachers' code of conduct. However, these sanctions tend not to be used in Ghana or elsewhere. The reasons in each country are unclear, but the political power of teacher unions often ensures impunity for all but the most serious violations.

HOW OFTEN WERE STUDENTS ABSENT?

Projected through the year, students missed relatively few days: from 3.35 days in Tunisia to 9.81 in Ghana and reported being late from 5.46 days of classes in Brazil to 10.7 in Ghana. These percentages are roughly similar to those reported by teachers and principals. In Ghana principals reported student attendance rates as 85% and teachers as 90%, while in Brazil, 98% of boys and 99% of girls were reported as attending regularly. There is a tendency for student absences to follow teacher absences, and the lower attendance in Ghana may be related to the high teacher absenteeism in that country. Students missed classes mainly due to personal or parental illness, family obligations. Reasons tend to be similar across countries, with the exception of Tunisia, where some students refused to go to school if they had not completed their homework, and Ghana where some students did not attend because they could not pay tuition.

In the countries where the research took place, gender was not an important determinant of absenteeism, so responses usually did not differ by gender. The survey did not explore whether students skipped classes and left early, as was often found to be in a 2004 study of rural schools in Bangladesh (Chapter 2).

It would be desirable to estimate the amount of learning time available after accounting for student absenteeism, but the latter is not a subset of teacher absenteeism. Students may go to school and find teachers absent, or they may be absent on days that teachers are present. Observations also suggest that two types of students exist: those who are up to date with the classroom material and attend regularly and those who know too little to keep up and attend sporadically. Without more detailed data, the amount of total learning time given student given absenteeism could not be calculated.

HOW MUCH OF THE CLASSROOM TIME WAS USED FOR LEARNING ACTIVITIES?

The Stallings Classroom Snapshot, a well-known U.S. instrument, was adapted for international use. The system helps record and classify activities as interactive (instruction, discussion, questions), passive (copying and seatwork), and management (various activities peripheral to instruction). It also records a rough percentage of students who appear to be off-task (Table 3-3). Classrooms engaging students interactively are more efficient and may be more likely to foster memory consolidation than classrooms where students spend more time on non-instructional activities or are off-task.

Table 3-3. Percentage of Time Spent in Instructional Tasks

Instructional Strategy % of time	U.S Classroom Criteria	Pernabuco (Brazil)	Ghana	Morocco	Tunisia
Interactive instruction	50% or more	**52.4**	**59.9**	**62.8**	**61.2**
Oral Reading		6.7	8.7	15.7	15.3
Teaching, Explanation		32.8	19.9	26.7	27.9
Discussion		6.3	24.1	6.6	6.2
Practice Drill		1.4	6.5	12.3	11.3
Passive instruction	35% or less	**19.6**	**10.3**	**19.9**	**25.6**
Seatwork		16.3	7.4	14.8	22.9
Copy		3.0	2.9	5.0	2.7
Total Instructional Time		**72.1**	**70.2**	**82.6**	**86.7**
Organizing/Management	15% or less	27.9	28.0	17.8	13.3
Student Off Task Rate	6% or less	**19.3**	**21.1**	**9.2**	**9.9**

Observations showed that the most important block of time lost tended to be inside the classroom. Ghanaian teachers spent 70.2% of the time engaging students in learning, while Tunisian teachers spent 86.7% of the time. Overall the largest chunk of time is spent on instruction, either lecturing or explanations. This ranged from nearly 33% in Brazil to 20% in Ghana.

Teachers in all four countries addressed the entire classroom 70-90% of the time (Figure 3-4). They mainly just talked and used the blackboard ("chalk and talk"), while students wrote

on notebooks. This activity delivers material efficiently from the teacher's viewpoint, but if it prolonged it can result in limited student attention and subsequent recall. (In fact, lecturing can be considered active engagement for teachers and passive for students.) One might expect limited interactions to happen mainly in large classes, but it happened everywhere. Average class sizes were reasonable, (ranging from 25 students in Pernambuco to 31 in Morocco), but class size was correlated only to a small extent with the likelihood of a teacher addressing the entire class (r=0.13), with the likelihood of addressing a single student (r=-0.12), and the tendency to lecture (r=-0.28). Predictably, the time allotted to discussion and oral practice drill tended to be limited (Table 3-3), although students could be repeating in unison during some of these activities.

Figure 3-3. Interactive teaching: brief lecture, practice, discussion

Lecture	Practice drill, discussion
	
Source: Barnette and Benavot 2005.	*Source: Barnette and Benavot 2005*

Less effective learning delivered. Cognitive research suggests that students are more likely to retain material that they have had the chance to contemplate and to encode in multiple cognitive networks (visual, auditory, etc.).[107] Though engagement rates seem high, the activities observed overall gave few opportunities to contemplate the subject matter. It was unknown whether appropriate teaching aids were available in the schools surveyed, but manipulables (such as geometry tools) and audiovisual equipment were used only about 3% of the time. Textbook use ranged from 23% of the time in Pernambuco to 7% of the time in Ghana, where few textbooks exist. Little time was spent reading aloud in Pernambuco and Ghana (6.7-8.7% of the time) but much more was spent in Morocco and Tunisia (about 15% of the time), where koranic reading is also taught (Figure 3-5). In all four countries, less than 5% of the time was spent in group activities, that might help contemplate the concepts taught.

107. See Abadzi 2006, chapters 4 and 8

Figure 3-4. Whom were teachers addressing in class?

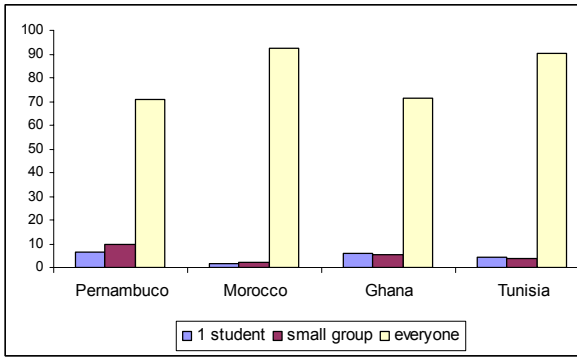
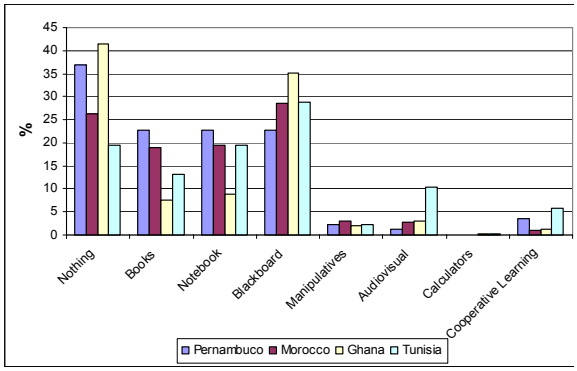


Figure 3-5, Use of Instructional Materials by Country



The non-instructional time was taken up with organization/management activities, some of which are necessary, but also included socialization and the teacher being out of the room. In Ghana and Pernambuco, 28% of classroom time was taken up by such activities. Possibly due to poorly organized learning activities, 19.1% students in Ghana and 21.3% in Pernambuco were on average "off task," uninvolved with class activities. By comparison, only about 9.9% of Tunisian students and 9.2% of Moroccan students were "off task" during class (Table 3-4). This observational inference suggests that students might not be learning when distracted. As a result, Tunisia and Morocco offered not only more class time in learning tasks, they also engaged a higher percentage of students in learning than Brazil and Ghana. It can be argued that the former countries teach their students more efficiently than the latter.

Grade-wise changes. The frequency of various classroom activities predictably changes with age. Teachers of lower grades spent more time on organization, and younger children had higher off-task rates, given a briefer attention span. With the passage of years, reading aloud and drill tend to diminish while lecturing and discussion increases. For example, in Morocco reading activities took up about 17% of the time in grades 1 and 4, but only 2.5% of the time in grade 5 (and 15.1% in grade 6, as students perhaps prepared for examinations). In Brazil 8th graders spend proportionately more time copying because they do not have textbooks at the secondary level. Tunisian 6th graders and classes with a larger percentage of male students were slightly more likely to be off task and less likely to be engaged in interactive instruction. Gradewise time on task indicators can be compared in grade 4, which was measured for all countries (Table 3-5).[108]

108. A large-scale US study found that fifth graders spent most of their time (91.2%) working in whole-group or individual-seatwork settings and only 7% of the time in small-group instruction (two to five students). In the same grade, 37% of instruction was in literacy and 25% was in math, while in first and third grades, more than 50% of instruction was in literacy and less than 10% was in math. Science and social studies activities occurred in 11 and 13% of intervals in fifth grade, respectively. In the fifth grade spent 17%of their time instructing students on managing materials or time (Pianta et al. 2007)

Table 3-4. Average percentages of Time Use in 4th Grade (common for all countries)

Country	Discipline %	Student off Task %	Interactive learning %	Passive learning %	Organization-management %
Pernambuco	1.75	18.21	52.89	18.61	28.50
Ghana	1.44	25.92	52.50	12.50	35.00
Morocco	4.20	9.37	62.85	20.03	17.78
Tunisia	0.88	9.64	61.70	26.32	11.98

Parents may not always be aware that time in their children's classrooms could be used better. Most parents in Pernambuco (77%) do not complain about absences, and 87% of them expressed satisfaction with students' teaching and learning processes.

Engaging students in learning relevant to the curriculum. The study measured engagement in any kind of learning activity that the teacher organized. It was not possible to measure time spent on the last parameter of the instructional time model, which is time spent just on relevant curricula. To do so, more complex instruments would be needed, such as student artifact studies, video studies, observations by supervisors knowledgeable in each subject, or interviews with evidence regarding how far students are behind given curricular specifications. Such a study would have taken more time and funding than was available. However, informal observations in lower-income schools suggest that some learning activities were appropriate for lower grades but had not been mastered earlier.

HOW MUCH HOMEWORK DID STUDENTS COMPLETE?

Homework increases instructional time, and all countries asked survey questions about it. Parents, students, and teachers generally agreed about homework frequency and effort. Teachers estimated that they gave 1 to 3 hours of homework, while most students reported spending at least 1 hour or more on their homework (Table 3-6). Nevertheless, in many areas individual students lack textbooks, and it is uncertain how much homework can be done under these circumstances and what its value is. Therefore this variable was not added in the instructional time model.

Table 3-5. Homework Efforts Reported by Students and Parents

Homework Effort	Pernambuco %		Ghana[1] %		Morocco %		Tunisia %	
Respondents[2]	Parents	Students	Parents	Students	Parents	Students	Parents	Students
Less Than One Hour	24	27	84	54	54	58	31	54
1 to 2 Hours	56	44	14	6	35	16	40	15
2 to 3 Hours	14	13			4	4	12	3
3 to 4 Hours	3	8			1	1	7	1
4 to 5 Hours	0	5					1	1
More than 5 Hours	2	2						

[1] Ghana's questionnaire did not permit responses beyond more than one hour of homework.

TRENDS IN LINKAGES BETWEEN LEARNING OUTCOMES AND POVERTY STATUS

This study could obtain only preliminary evidence on the linkages between time loss and student performance. Achievement test data were available only in Pernambuco (Education Evaluation System of the State of Pemambuco-SAEPE). Due to various data and computational issues, measurement precision was modest. Also, for logistics reasons, multiple regressions were computed rather than hierarchical linear modeling, a process that may bias some standard errors and effect sizes.[109] Nevertheless, low but significant relationships were found between achievement and various time indicators. After controlling for socioeconomic indicators, regressions showed that significant amounts of test score variance were predicted by: (a) the number of days Brazilian students missed, (b) the number of teachers absent on the day of the survey, (c) amount of passive instruction (often related to lower test scores), and (d) management activities. Approaching statistical significance ($p<0.07$) was the number of times a teacher left early the previous month.

Area-level socioeconomic data were available only for Pernambuco and Morocco. In both countries time parameters showed low but statistically significant relationships between instructional time use and socioeconomic indicators, such as area life expectancy, income level, and literacy rate. Particularly in Morocco, poverty rate and rural school locations were positively correlated with school closures, interactive and passive instruction, time spent in management, and off task behaviors. In general, interactive learning time was negatively correlated with poverty and urban location. Though this finding is preliminary, it is consistent with earlier research in the US which showed that in poor areas students have less instructional time (Chapter 2).

METHODOLOGICAL LESSONS AND DATA LIMITATIONS

The study mainly sought to develop a feasible methodology for measuring instructional time use across countries. It was found that it is possible for governments to do so in a reasonable time period, and with a reasonable cost. Three of the four countries were in the middle-income range, but the Ghana Ministry of Education also successfully carried out the survey and processed the data.

However, instructional time concepts are not widely known. Thus, the study faced several methodological challenges that included lengthy implementation delays, an insufficiently detailed assessment of school closures, and surveys modified by different countries beyond comparability. One consequence of collaborating with Ministries of Education rather than hiring consultants was that each country administered slightly different versions of the questionnaires. Some government staff did not sufficiently understand the purpose of various survey questions and the importance of obtaining clear numerical answers that would help estimate the number of days lost. The data collected by the study were treated statistically to extract similarities and equate to the extent possible the time losses reported in each country in order to compare them. As a result of these problems, the datasets included measurement error that reduced the potential strength of relationships among various variables (Annex A).

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109. Osborne 2000

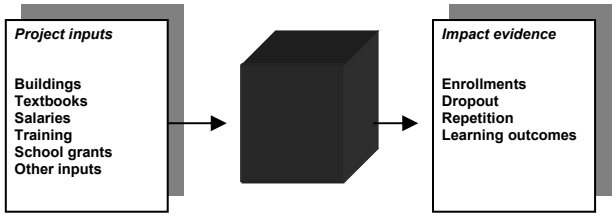
This study was only the first phase of this research topic and it concentrated on assessing the number instructional hours of schools. It did not deal with the amount of time and number of breaks, lunchtime, or other issues involving the distribution of time in a school day. Also it did not delve into issues of 'classroom climate' and emotional support, which are important but not easily measured. Given the limited timeframe and choice of countries it was not possible to get more achievement test score data. In future work, efforts should be made to get national, international, or regional test scores for schools (e.g. TIMSS, PIRLS, SACMEQ, PASEC).

Based on the results of this study, the instructional time instruments have been revised. It is likely that greater measurement precision will show greater time loss, although measuring ever smaller segments of time loss may reach a point of diminishing returns. Nevertheless, the lessons learned thus far permit the development of some hypotheses that can be tested in subsequent research. These are presented in the next chapter.

4. IMPROVING INSTRUCTIONAL TIME USE: POLICY IMPLICATIONS

Classroom activity represents the moment when the education financing gets converted into knowledge. For decades it has been uncertain which variables are most important for this process. Classroom events have often been considered a 'black box', involving details into which donors and some governments have traditionally hesitated to delve. Without this information, the donor community finances educational inputs (salaries, buildings, materials) without a clear hypothesis of how these will lead to outcomes.[110] Not surprisingly, learning outcomes are often limited (Figure 3-1). This study offers a glimpse of "black box" variables that have been outside the radar screen of the education sector. For poorer areas and countries, these "details" are too important to overlook.

Figure 4-1. Classroom instruction as a black box mediating input and outcome variables



Instructional time is the mediator variable that has escaped scrutiny and measurement thus far. Learning outcomes should not be expected without sufficient teaching and practice to master the instructional objectives of specific subjects. In very gross terms, if schools use 39% of the available time, they may teach only 39% of the curricular objectives. Since knowledge is cumulative, performance losses should exceed 39% over time. Curricula worldwide are overloaded, so even modest time wastage may result in significant student losses. To make up for absenteeism, teachers may just lecture in a hurry rather than and analyze the content and use the teaching aids provided to schools, or they may omit parts of the curricula. So, the average Ghanaian public-school students cannot master the curricula just by going to school; they need private tutoring to pass exams.

Discussions of educational expansion in low-income countries often bring up a tradeoff between quantity and quality. But aside from the instances where instructional time is cut purposefully to fit more students in multiple shifts, the tradeoff may not exist. In effect the issue is *quantity of teaching, sufficient to master the prescribed curriculum*. Good time use is not sufficient to produce quality teaching, but it is necessary. For greater efficiency, activities must be used that help students form linkages among pieces of information and retain the information for the long term.[111] The real tradeoff may be the lack of supervision and interest in whether teachers attend to low-income students.

110. IEG 2006b.

111. High-quality teaching also means offering immediate and corrective feedback and creating "useful difficulties" that have may enhance memory, such as challenging students to invent processes for dealing with problems (e.g. Bjork and Bjork 1992).

The current study has shown that even in the better-off countries instructional time may be wasted or used suboptimally. This loss may account for some puzzling performance problems. For example, Argentina has made much investment on teacher training and instructional materials, but no change is evident in test scores.[112] Yet the sophisticated Argentine school system largely leaves curricular decisions up to the teachers, relies on copying, uses time to distribute and collect textbooks several times a day, and thus spends much expensive time in non-instructional "management" Giving students textbooks and reducing these "passive" activities in favor of interactive time and feedback might increase student achievement.

The more this topic is understood and discussed, the likelier it is that some measures can be taken. Some options and considerations derived from the findings and from the literature review (Chapter 2) are mentioned below. These would be hypotheses to test in subsequent research.

ECONOMIC IMPLICATIONS OF INSTRUCTIONAL TIME USE

Even as a methodological pilot, the study confirmed that under some circumstances the time and opportunity to learn are very limited. Time is a mediator variable that has escaped scrutiny and measurement thus far. It is not enough to provide the ingredients of instruction and assume that they will be used in class. Students must get sufficient time to master the instructional objectives intended in specific subjects. Furthermore, inputs like teaching aids must be employed within the timeframe available to students, or they may not promote student learning. The time devoted to learning the material prescribed by the curriculum may be the crux of educational "quality". The quantity-quality tradeoff that is often mentioned in relationship to rapid expansion of education in low-income countries may be mitigated if measures are taken to give students the instructional time they need, even as class sizes increase.

The study did not include an economic analysis, but the findings suggest that instructional time loss has significant economic implications. Government revenues pay for teachers' salaries, buildings, teacher training, and materials, and it is expected that 100% of this investment will be used for student learning. In fact, an hour of class in a particular school is a budgetary fraction corresponding to the amount of time schools officially operate (about 180 days, 4-5 hours per day at the primary level). It is possible to cost time wastage down to the minute. Probably no schools use 100% of time well, but losses of the magnitude shown in this study suggest that schooling costs more than it ought to or achieves less for what it costs. Some of the implications are:

Misleading education expenditures. Education expenditures, measured as a share of GDP or of total public expenditures, are used to estimate financing needs for specific countries, and economists often find that expenditures must increase. However, increasing public expenditures for any level of education when time use is poor increases inefficiency and wastage. If a country doubles its education budget but still continues to use only half of the available instructional time, the extra financing will have a much smaller impact.

112. IEG 2006b.

Time use should be estimated and taken into consideration before such decisions are made.

Invalid cross-country comparisons. Education expenditures are often compared among various countries and regions. Some countries may devote a smaller percentage of their GDP to education but use time better and thus use funds more efficiently than others which spend more and waste more. Comparisons may be misleading if the percentage of instructional time used in various countries varies dramatically.

Underestimated teacher salaries. If wages are calculated based on the number of hours staff really work, teaching in some countries may really be a part-time job, whose earnings are considerably higher than formally calculated. Low salaries may force some teachers to work elsewhere and drive the more efficiently working people out of the profession. But before efforts are made to increase salaries, it is important to show how much teachers are paid for the work they do and the likely financial loss that will result if their salaries are increased without improved instructional time.

Distorted rates of return. Rates of return are calculated with the implicit expectation that students will be taught and will actually learn basic skills. Projections such as the amount of marginal earnings of an additional year of schooling may be unrealistic if students are served for only half the year or if students are illiterate and cannot benefit from the instruction. In particular, assumptions about the pro-poor poverty alleviation effect of education may be unrealistic, given that the schools of the poor make less effective use of instructional time.

Hidden social inequity. Uneven time loss could also affect the benefit-incidence analyses and Lorenz curves. Primary education is generally considered to be more pro-poor than other levels of education, so it has more low-income schools. If, however, time is used less well in the schools of the poor, the equity effect is reduced. More public investment at that level will not mitigate poverty, unless it increases instruction.

Confounded internal efficiency indicators. Data linking internal efficiency measures to time loss are sparse, but unless students have access to private tutoring, learning outcomes are affected by the amount of instruction students get. Other things being equal, repetition and dropout are likely to be higher in a country which uses about 40% of instructional time for learning (e.g. Ghana) than in another which uses about 80% (e.g. Tunisia). Furthermore, when these indicators change over time, the reasons are unclear. Dropout could be due to external factors (e.g. being AIDS orphans or getting better job opportunities) or to limited instruction.

Underestimated unit costs. When time is wasted, governments assume that students get services that are not in fact provided, so unit costs per student would be distorted. However, unit cost per successful graduate would more accurately reflect the real cost of providing services to students.

An important task is to inform governments of this little-understood issue and engage them in policy dialogue to *modify the policies that affect instructional time.* For example, failure of schools to start on an appointed day is often due to late teacher assignments,

ongoing registration, and school repair issues. In some countries (though not in the ones included in the study) rural teachers must travel to nearby towns to get paid, closing the schools. Local-level flexibility regarding the dates schools start and end is desirable but may result in abuses, since monitoring becomes difficult. In countries where these issues are a problem, policy discussions must focus on them and measures must be taken to eliminate the root problems.

There is some evidence across countries that teacher absenteeism is related to accessibility. Investments in rural roads and transportation might be studied for an impact on improved teacher attendance. These may be important in helping teachers who live at some distance come to the school every day rather than take off Mondays, Fridays, and the holidays. Similarly evidence might be sought regarding the effects of improved working conditions. More attractive schools have been linked to the likelihood that students and teachers will stay on the premises.[113] The costs and benefits may be examined of building more attractive schools at a slightly higher cost or of repairing schools to improve appearance and functionality.

TEACHER ATTENDANCE AND ACCOUNTABILITY

Wastage of instructional time to some extent may be "normal." It may be due to the makeup of the human reward system of the brain that is set up to function on a short-term frame, and the rewards of the teaching profession for teachers are not immediate (if they can be obtained at all).[114] Unless teachers actually enjoy interacting with children and are reinforced by small improvements in day-to-day learning, a bit of daily time loss seems inconsequential. Children usually prefer not to study, anyway. The stresses of large classes, unresponsive students, and insufficient knowledge to deliver demanding curricula may make teachers avoid the tasks that they consider tedious. The solitary nature of the job makes it possible for teachers to get away with little work, particularly when school management is ineffective and the parents are poor.[115]

Poor service provision to low-income populations is a problem in education, but similar trends are found in health studies (Table 2-2). [116] What incentives have been more effective in getting teachers to show up? Effective options thus far have been limited.

Educators consulted during the research overwhelmingly suggested salary increases. However, these increases are not usually linked to improved attendance.[117] Nevertheless, teachers in some countries are so poorly paid that few can afford to live just from teaching. In some countries it is appropriate to question whether there should be many poorly paid teachers who work part-time or fewer and better paid teachers working full-

113. OED 2004.
114. For a detailed explanation of the neuropsychological research available see Abadzi 2006, p. 120.
115. Bridges and Hallinan 1978.
116. In addition to high absenteeism, health care providers often withheld available care from the poor, did not follow protocols, or did not give the poor the best advice. (Das and Hammer, 2004, 2006; Leonard et al. 2005)
117. Chaudhury et al. 2004a, 2004b, 2004c

time. Efforts might be made to create wage incentives in poorer areas, though incentives are difficult to manage, and their impact is uncertain.[118]

Study participants also suggested *enforcement of rules that already exist*. However, many governments are unwilling or unable to control teachers and unions. In some countries, teachers, rather than parents of poor students, may be the governments' clients. They are a large electoral block that is capable of much mobilization, long strikes, and also allegiance to favorable governments. Unions may thus be able to hold frequent and prolonged strikes with impunity and with pay. Also, unions may secure important concessions that include 1-2 days of personal leave per month and thus making absenteeism legal. Medical leave may be abused by teachers, who may abandon classes for months at a time despite a lack of substitute teachers. However, few countries dare to fire non-compliant teachers or even hold them accountable. To deal with teachers' interaction stress and the low pay that often comes with large numbers of employees, teachers may be programmed for fewer hours than expected to teach by law (only 15-18 hours in many Indonesian schools and in the Middle East; Chapter 2).[119]

It is important to communicate effectively to teacher unions the specific effects of time loss, possibly through public awareness and pressure. There is also a need to get more buy-in from teachers on time use. Many may not be well aware of how their habits add up to disadvantage the poor, who cannot afford private coaching classes. The World Bank has made various attempts at policy dialogue, particularly in the LAC region. The donor community can prioritize dialogue on this and on related issues shown below.

EFFECTIVE SUPERVISION - STRENGTHENING THE SUPERVISORY CHAIN

Sometimes a low-level equilibrium of instructional time seems to exist that meets minimum requirements for employment and community complacency. This level may become the norm in a certain locality, and families may be unaware of the discrepancy between intended and actual instructional time. Education officials may also implicitly accept the gap.[120] Lack of accountability means that there is no pressure to change this equilibrium.

Typically teachers have the obligation just to deliver the lessons, rather than ensure their mastery, and mere delivery can be done in relatively little time. Nominally, school administrators should be doing quality control. However, in areas such as Pernambuco, principals stated that they were merely responsible for recording absenteeism, not for doing something about it. If administrators do not show interest into how time is used and do not urge teachers to use it well and follow up with them, teachers receive a clear signal that attendance is left up to their conscience.

The lack of interest from superior to subaltern suggests a breakdown in the supervisory chain from the central, state or municipal authorities down to schools. Governments should take actions to strengthen this chain, providing training and feedback to teachers and principals on use of time, and empowering communities to monitor teacher activities

118. Vegas 2006
119. IEG 2006a.
120. EARC 2003

(as has been the case in Honduras and El Salvador).[121] If superiors demand that time be used better and that teachers be evaluated based on time use, their subalterns are more likely to ensure that this happens. This means that governments must be convinced of the need to take action at the district and local levels, and the public must understand this issue better.

Increasing the frequency of inspections, particularly in rural schools. In different sector-country combinations, lower absence rates were associated with either the frequency of visits in the facility's district or the facility's proximity to a supervising ministry office.[122] Since inspections and supervision are often problematic, focusing school-based management on instructional time issues may be effective. School systems may also offer intrinsic rewards to teachers who are rarely if ever absent. Methods such as bonuses for evidence of attendance (e.g. a snapshot as used by a Rajasthani NGO) may succeed in improving attendance. Workshops and in-service should not be organized during teaching hours unless the school year is lengthened by a commensurate number of days. It may be cost effective to pay teachers extra for in-service training.

Making supervision effective. Often supervisors really are not sure what to look for. One reason for limited or non-existing supervision is the vagueness of observation criteria and the large amount of time that teacher observation often requires. The guidelines and requirements needed to focus local authorities on how well students are taught can only take up a few minutes. The composite variables of the classroom Snapshot (interactive and passive instruction, organization, no instruction, and percentage of students off task) constitute a supervision framework and can furthermore be observed within a few minutes. Other techniques of 5-minute supervision also exist and may be easier to use than lengthier procedures often legislated for public schools.[123] In addition, showing interest in teachers' timeliness and praising them when they come on time and use time well may achieve a lot.

Figure 4-2 Student groups engaged and supervised (Indonesia)



Figure 4-3. Groups unsupervised, engagement uncertain (Brazil)



Source: author

121. OED 2004a
122. Teachers in Bangladesh were 10% more likely to be absent in secondary schools that had never been visited by education officials. Secondary school teachers were 68% less likely to be absent in schools attended by pupils with better educated mothers (Chaudhury et al. 2004a).
123. E.g. Downey et al. 2004

IMPROVING LOCAL GOVERNANCE AND STAKEHOLDER INVOLVEMENT

Central governments aside, schools and local educational authorities have also paid little attention to time loss and its costs. As the data from Pernambuco showed, many school and class registers had scarcely been filled, a sign that local authorities may not search for the evidence of instruction that registries could provide. One problem is that schools and teachers often get little supervision from principals and supervisors, and that time use is not a variable that is used frequently. Hopefully the data from this and other studies will have some effect as findings are disseminated.

Weak incentives for performance, corruption, imperfect monitoring, and administrative logjams are frequent culprits. Some countries have tried to address the problem by involving the stakeholders in service delivery. Sometimes results have been impressing. Giving parents a voice over their children's education, patients a say over hospital management, making agency budgets transparent-all contribute to improving outcomes in human development. [124]

However, low-income parents often do not know how to recognize the features of effective schools. It is possible to raise consciousness among parents improve local governance by disseminating information on the visual hallmarks of effective schools: teacher attendance, textbook provision, time use in interactive instruction. A potential outcome measure to be used is that all students should become fluent readers by the end of grade 2.[125] Parents and village elders (even those who are illiterate) can perceive and monitor reading fluency, because it resembles human speech. Similarly, simple goals may be established for math. These characteristics can be taught through videos that contrast acceptable and unacceptable features in schools as well as examples of children who can read fluently.

TRAINING AND CONSCIOUSNESS RAISING ON THE CONSEQUENCES OF TIME LOSS

Good time use in many societies is not a priority, and this concept may be novel, particularly for educators who have spent a lifetime moving at a certain pace and watching their own teachers do so. Suitable and "memorable" training is needed to show the effects of time loss at all levels of the educational chain and to promote culturally viable strategies for doing so.

- High-level officials may be engaged partly through WBI (and the Joint Africa Institute). Decision makers may be asked to think about the points in their systems where intervention may increase instructional time and discuss measures that are likely to be politically acceptable. (See exercise in Annex C.);
- The media may be used to raise awareness the public and to discuss the budgetary and learning implications of time use. Audiovisual means (presented during meetings or through TV programs) can show what occupied and idle classes look like as well as how children should read at various ages when classroom time is used well; and

124. World Development Report 2004.
125. Abadzi 2006

- Principals, supervisors and inspectors at the provincial and local levels could be trained to increase instructional time but also to document time use in the school as well as the classroom. A key issue is to demand visible student progress at brief intervals, thus creating pressure on teachers to progress. Classroom events can be evaluated through the variables outlined in the classroom Snapshot (interactive and passive instruction, management, students' off-task). Principals may guide teachers to maximize interactive instruction and minimize organizational activities in order to maintain student attention and minimize time off-task. District directors might make a clear commitment that they will ask for reports of instructional time use and follow up with their subalterns. Closer control, follow-up, and social pressure may result in reducing time wastage by teachers.

Incentives aside, there is a need for teachers to learn how to engage all the students all of the time and how to manage classroom events so as to minimize time loss. Training teachers to use time better is particularly challenging in low-income countries, given low levels of education and a long tradition of time wastage at all educational levels. Teachers tend to be unaware of the degree to which their habits impact student learning, and data from this study suggest that some spend more time in "classroom management" activities than others. To decrease off task behavior, teachers need better classroom management strategies to gain and retain attention of the students. Thus, time management should be included in pre-service and in-service curricula. However this is a challenging task, given that training programs often fail to modify behaviors. Training programs in many countries are weak on classroom management strategies, and outside expertise is needed.

Many techniques have been developed to decrease off task behavior and retain attention of the students in the classroom that are often not part of teacher training curricula (such as proximal control, signal interference, hurdle help, buzz groups, key group monitoring). Also, bibliography on time savers for teachers can be adapted to lower-income schools.[126] Exercises with videotaped evidence can help them reflect on the effects of poor time use on students, their habits and the habits of their own teachers whom they role-modeled. They can also learn to plan and organize the material better so that the class can spend its time working rather than waiting.

Systematic classroom observation techniques like the Snapshot can affect positive change in the teacher behavior when feedback is given from the profiles generated from them.[127] Additionally, teachers may give more credence to recommended changes in their instruction if supported by evidence collected through observation.[128] There are some challenges with using systematic classroom observation to assess instructional time; notably the presence of the observer in the classroom may lead to invalid conclusions based on reactive effects such as evaluation apprehension and socially desirable responding on the part of the teachers and students. There are also questions about the amount of time that is needed to collect reliable and valid information about classroom behaviors.[129] Another difficulty in carrying out time-based planning is the discrepancy between how teachers and students experience time. There is a tendency for most

126. E.g. Wachter and Carhart 2003; Gore and Dowd 1999; Wood 1999
127. Stallings and Freiburg 1991
128. Anderson and Burns 1989
129. Kurz 2003

observations to focus on teachers and their behaviors, as opposed to students and their learning processes.[130] The impact of time on pupil learning may also vary in relation to the time of the day in which classes are held: morning, afternoon and, in some cases, evening hours. Many schools teach the more demanding and/or important school subjects during the early hours of the day, a practice indirectly acknowledging this relationship. However, US research suggests that with feedback teachers can be taught to use time more efficiently in primary and in secondary school.[131] Grant funds were used to pilot in Pernambuco a five-day training course that had been used with teachers in low-income urban areas of the US, but teachers in low-income countries often have low levels of education. Additional experimentation is needed with the prospective trainees to understand better how to proceed.

Figure 4-4: Indonesia: "Benefit from work time as much as possible"



Source: author

Knowing exactly what to teach on a given day and how to do it should result in better time use. If teachers do not know the material or cannot answer questions from students (as it often happens with primary-school math), they may avoid teaching and find other occupations while in school, including bureaucratic work. Ignorance of the subject matter (such as math of the upper primary grades) is a little-understood phenomenon that may compromise the efforts of governments to appoint qualified teachers, particularly in rural areas. Furthermore, teachers may waste time because they do not prepare their classes in advance. There is a need to transmit a repertory of routines on how to teach various topics so as to maximize time, how to evaluate quickly whether students learned the material. Also, as in Argentina, giving teachers textbooks rather than making them do the job of putting them together may ease the burden placed on teachers' administrative work.

OPTIONS FOR INCREASING STUDENT ACHIEVEMENT GIVEN LIMITED TIME USE

Efforts by governments and donors may improve time use, but inefficiencies are likely to continue. Taking the time-related variables into account is now simpler thanks to recent cognitive research that helps explain the role of practice and feedback as means to learn and recall complex knowledge structures.[132] With more applied research it may be possible to focus on activities that maximize learning efficiency and encourage their use over others.

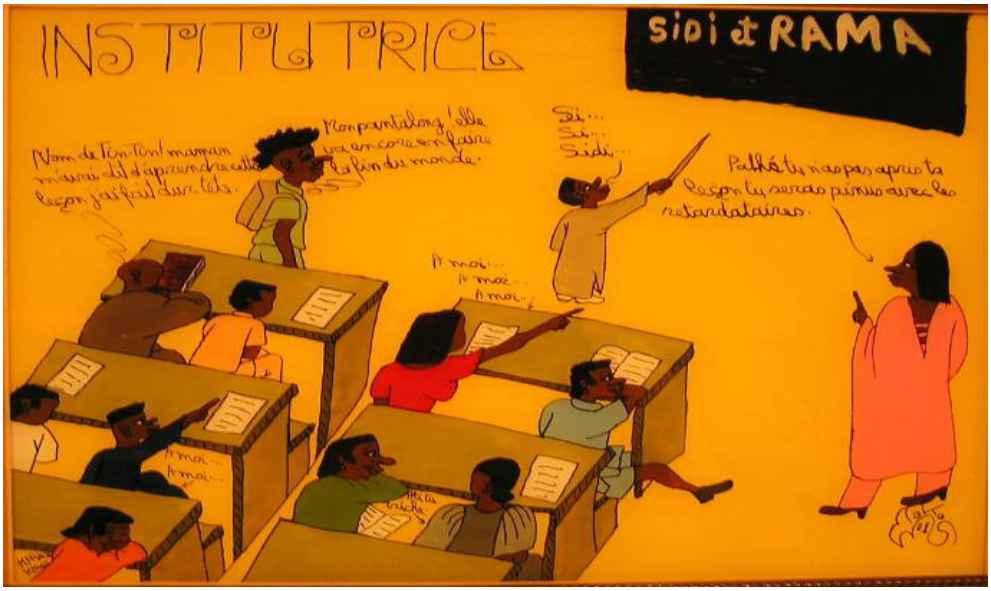
How can the poor learn basic skills in conditions of reduced time? Some options are:

130. Connelly and Clandinin 1993
131. Stallings 1975, 1980; Stallings, Needles, and Stayrook, 1979; Stallings 1985, 1986, Stallings and Freiburg 1991; Knight 2001.
132. See Abadzi 2006, Chapters 8 and 10 offer also learning implications for various interactive and passive activities.

- Instructional time should be reallocated towards basic skills (reading, language and math), reducing many of the less important courses and requirements that fill curricula in many countries.
- Textbooks for every student to take home and use in class reduce the time needed to lecture in class, copy exercises on the board, or hand out photocopies. Increased homework assignments constitute additional instructional time. Older students could help after-hours to help younger students with their schoolwork.
- Methods that have been shown to be more efficient should be disseminated through in-service training for certain subjects, such as phonics for reading.

In most cases lengthening the school day or year would merely perpetuate the inefficiencies.[133] However, poorer students may benefit from longer instructional days when used well.

Figure 4-5. How many students seem off task in this caricature?



Senegal – folk artist on glass

INSTRUCTIONAL TIME MEASUREMENT FOR EVALUATION AND RESEARCH

The parameters measured in this research could be useful as monitoring tools of governance and systemic efficiency. Well-managed schools should stay open for the number of days that governments specify. Researchers visiting schools should find school registries with numbers of days and hours per subject matter approximating those specified by the government. Low teacher absenteeism (e.g. below 10%) would constitute evidence of effective school-based management. Finally, time on task in class should constitute evidence of effective supervision by principals, inspectors, or supervisors. Measurements in Tunisia through this study (78%) and the Chicago public

133. From "Time and Learning in CA Schools" 1984 (unpublished mimeographic document).

schools (85%; Smith 2000) suggest that 80% use of time could be realistically attained. *This 80% figure could be used as a benchmark for lower-income countries to attain.*

Project evaluation challenges. The World Bank and other agencies try to evaluate project outcomes by comparing baseline to post-intervention data. Instructional time use is rarely mentioned explicitly during various interventions, and baselines are typically not available. How can a single measure at the end of a project help evaluate outcomes when the counterfactual is not known?

If project interventions resulted in better management, the amount of time used for instruction should increase over a baseline and approximate 100%, the amount that governments expect schools will devote to teaching students. Without a baseline it is hard to determine the amount of increase, but a criterion-referenced approach could be taken. Curriculum developers in a country can be asked to estimate how many class hours students would need to master objectives of specific subjects in various grades and also estimate the number of objectives likely to be missed if the available time were reduced by 20%, 40%, or 60%. In some subjects the loss would be limited to that subject (e.g. social studies), but in others, like math, losses in grade 1 would impact learning in higher grades and result in cumulative losses. It is possible to estimate and model these losses for evaluation purposes.

There is a further need to improve time measurement not only for greater reliability but also for ease of use and cost effectiveness. The concepts are complex, and different studies have used different methods. This project has resulted in improved modular surveys that obviate the need to craft new questionnaires every time a new study is initiated. Currently, data that would give a sense of baselines, range, and likelihood of improvement are limited, but as more are collected, these indicators will become more meaningful.

Research prospects. Much needs to be learned about the effects of time use on test scores and reading fluency acquisition in the early grades. It must be better understood how the various systemic inefficiencies impact the amount of time ultimately available for students in different countries. Clearly causality must be established to link time use and learning outcomes in longitudinal studies and clarify the relative importance of inputs such as textbooks and other instructional materials. The advantages and disadvantages of group work in time use must be also studied. Instructional time use in private and public schools within the same areas must be compared and patterns must be better understood. Memory research issues, such the rate and efficiency of consolidating new information need to be better understood vis-à-vis the amount and placement of instructional time as well as the activities that maximize long-term recall.

The future of the Education for All initiative may depend on how seriously governments and donors take instructional time wastage. Hopefully this research is only the beginning.

Annex A. Study Activities, Methodology, and Detailed Findings

As mentioned in the main text, the team decided to work directly with line ministries rather than hire local consultants in order to develop implementation capacity and ownership. Thus, much of the work was carried out by government agencies in collaboration with the task managers. Overall, the study carried out the following activities.

- *A survey of the research literature and development of a research design* in collaboration with the UNESCO International Bureau of Education (IBE; July – December 2003; see Chapter 2);
- *Development of questionnaires to assess instructional time use at different stages*. In collaboration with IBE, four questionnaires were developed aimed at (i) school principals, (ii) teachers, (iii) students of later primary grades, and (iv) parents. These inquired about various aspects of time loss, its reasons, and suggestions for improvement, and essential demographic information. The questionnaires were translated into French and Portuguese (September-December 2003); Tunisia and Morocco subsequently translated them into Arabic. Counterpart staff in the four countries of the study were asked to use them but adapt certain items if necessary for local conditions. (See prototype in Annex B);
- *Classroom observations for instructional time use*. The Stallings Classroom Snapshot, a well-known US instrument was adapted for international use. The instrument allows for specific, behaviorally oriented feedback to teachers and is useful for training purposes in addition to assessment. Counterpart staff in participating countries (students and professors in Pernambuco, pedagogical counselors and inspectors elsewhere) were trained in its use in five-day sessions. To ensure the stability of observational data, trainees passed examinations that included attaining acceptable inter-rater reliability and were certified as competent to use the instrument consistently;
- *Project launch workshop and training* in Tunis (January 2004), where the first batch of supervisors was trained and methodology was extensively discussed. Subsequent training took place in Rabat (February 2004), Recife (June 2004) and Accra (October 2004);
- *Data collection: School visits, administration of the questionnaires and the Snapshot* to a sample of schools in each country, cleanup and entry of data for later analyses (March 2004-July 2005 in various countries, see Figure A-2);
- *Socioeconomic and achievement data collection for the schools included in the samples*. Government offices were asked to provide any available data. Test scores were only available for Pernambuco, while socioeconomic indicators were available at the district level in Pernambuco as well as in Morocco;[134]
- *Development and piloting a training module* to provide feedback to teachers on the basis of the Snapshot results. Training of 28 district supervisors took place in Recife, Pernambuco (October 2005) and was videotaped for future use and improvement. The trainees were enthusiastic and learned the meaning of the codes and how to increase

134. Haut Commissariat du Plan 2004. Moroccan student grades were also made available, but these could not be equated and used.

active instruction and accomplish classroom management activities efficiently. (At the time that the report was written, follow-up had not been conducted to find out whether trainers had used these skills.);

- *Development of new software* for the scoring of the Classroom Snapshot to be used in future assessments;
- *Data analyses and report writing* (January-August 2006). Data from the four countries were analyzed separately as well as collectively. In Tunisia and Pernambuco, the data were also analyzed locally, and reports were written that we taken into account in this document;
- *Dissemination.* Instructional time policies would be presented to World Bank staff in October-November 2006. In collaboration with IBE an international conference has been planned to share the results of the research, sensitize policy makers to the issue of time, and plan for effective interventions; and
- *Application of this work* in India under different funding arrangements.

School Sampling Design

The study was conducted in Brazil, Ghana, Morocco and Tunisia from 2004 to 2005 (Tables A-1 and A-2). Schools in each country were chosen through cluster sampling to represent the country's demographics, the regions of the country, and urban and rural populations. Ultimately, the choice represented local realities and convenience. In Pernambuco, 180 schools were selected from areas relatively close to Recife (in 10 of the 17 administrative districts), but also schools that had scored low, middle, and high in the state's standardized achievement test of 2002 (SAEPE). In Tunisia, the sample included 51 public and community-managed schools chosen randomly in six districts (Tunis, Le Kef, Monastir, Kairouan, Gabès, and Tozeur).

Table A 1: School location by country

	Pernambuco	Ghana	Morocco	Tunisia
Urban	174	45	87	16
Peri-Urban	0	34	NA	NA
Rural	6	124	83	26
Total	180	203	172	51

Note: The location of 9 Tunisian schools was not specified

Within the schools, certain grades were chosen for observations through the Snapshot. In Tunisia grades 1, 2, and 4 were observed (classes chosen at random through SPSS in case of large schools), while in Brazil grades 2, 4, and 8 were selected. In Morocco, grades 1, 4, and 6 were selected and in Ghana, grades 1 through 6 were all observed, although grades 2 and 6 had a greater frequency of observations. Morocco and Tunisia carried out two observations per classroom.

The plan was to collect the information in each country in the course of about 5 weeks through 15 teams of 2-5 enumerators. Some areas took longer; in Pernambuco data were collected in June-August 2004. Questionnaires and observations were administered concurrently.

Teams of trained observers visited schools, spending about three hours in each. They administered questionnaires, ascertained how many teachers were absent on that day, and observed a subset of classes through the Classroom Snapshot (grades 1-2, 4, and 6). Interviewers were expected to verify teacher attendance in person, but in some areas the teams concentrated on observing instructional time, and schools staff were asked to fill out questionnaires and return them by mail. Thus teacher absences were not always directly observed or verified through registries.

Table A 2: Respondents of Survey Questionnaires

Cross Country Comparisons

No. of Respondents	Pernambuco	Ghana	Morocco	Tunisia
Schools	180	203	172	51
Principals	180	214	172	51
Teachers	539	419	343	141
Students	178	1267	3916	1275
Parents	178	417	1960	1201

Methodological Challenges and Solutions

Obtaining instructional time loss estimates that could be compared across countries and doing so with reasonable costs and logistics posed considerable logistical and analytical challenges. The section below details the decisions and outcomes obtained. Future work should build on these experiences.

The questionnaires developed jointly by the World Bank and the UNESCO-IBE were translated into French and Portuguese and given to Ministry of Education staff during a visit to the country. Since not all systems are the same, staff were asked to adapt some questions as needed in the local context. However, the concept of measuring time loss was unfamiliar, and some changes were excessive. Countries did not include all items, or they modified them in ways that changed the information to be obtained. In some items wording became unclear or incomprehensible; for example it was uncertain whether teachers in Tunisia reported only unexcused absences and whether Moroccan participants understood the sophisticated vocabulary used in the questions. Other items meant to elicit specific figures were replaced with ranges (e.g. e.g. whether schools were closed for 1-3 days, 4-7 days, 8 days or more). In Pernambuco, much of the questionnaire content was discarded and replaced with items that invited vague responses (e.g. teachers were asked if they were late "often, sometimes, never"). It became necessary to administer the questionnaire (approximately a year later, on June 13-17 2005) to a subsample of 40 Brazilian schools to obtain more specific estimates of time lost. Some differences were discovered during data analyses, and significant data cleaning and recoding were required to make comparisons possible. (See results section.)

One-time visits and triangulation of opinions. In principle, it would be preferable to visit schools repeatedly and register attendance, as teacher absenteeism studies have done. To pilot rapid and inexpensive methods it was decided to carry out one visit and get information from multiple sources, including comparisons with the previous year. The one-time survey had disadvantages that included potential systemic biases regarding the day of the week and season. Several assumptions were made for the purposes of data analysis (see sections

below). Nevertheless, a single visit may reliably provide overall time loss estimates; a Dominican study that involved three monitoring visits showed that the average time schools dedicated to learning was overall the same (65% in the first two visits and 64% in the third; EDUCA 2005.)

Estimation of time lost. Studies that involved repeated and lengthy observations (e.g. in Bangladesh) sometimes found large amounts of lost time that the current study evidently missed. These were due to inquiries about time losses that the current study did not foresee or inquire about: frequent cancellations of the first one or two instructional hours due to rain (in Pernambuco and also in a 2004 study on Bangladesh), impromptu strikes and walkouts by students and teachers (according to a 2005 Senegalese study) or preparation for athletic events (according to a 2003 Ghanaian study). Unfortunately the BNPP study did not have the benefit of these insights and did not explore the loss of time in sufficient detailed. Human memory tends to fail when asked about the frequency of repetitive events, and school staff may have unwittingly or deliberately given low estimates of school closures. Poor recall may have been more pronounced towards the end of the school year. For example, Moroccan principals reported few if any days of closure (mean 1.38 days) despite earlier informal observations suggesting frequent cancellations (e.g. OED 2001). By comparison, Tunisian principals may have been more accurate in reporting closures (projected at 5.15 days), and may thus appear to use time less well. (Subsequent surveys must be more specific, graphically showing the calendar days in the school year and inquiring about absences before and after specific holidays.)

School and classroom registries in principle should provide attendance data or evidence of schooling. The team was warned that these are often incomplete or missing, and indeed they proved unreliable. Though all countries were asked to find these documents and register their contents, none of them did. (Tunisia reportedly has these data computerized, but linkage to the database has been difficult.) The registries for grades 1-8 were specifically sought in a supplemental study of 40 Brazilian schools, and it was found that 52% of them did not exist in class; of those that did, 74% of them were not filled. Apparently there was no systemic need for this information.

Instruments of the Study and Their Use

*(a) Surveys on instructional time use***.** The questionnaires querying principals, teachers, students, and parents on time use were collected on the basis of the schedule shown on table A-3. Other data on absences, the use of homework and demographic data were also collected. (Morocco added an observer module.)

The questionnaires were administered in the various countries at different times during the school year. It would have been desirable to coordinate administration and eliminate a source of error related to requesting recall at different times of the year. With the passage of time participants possibly lose track of the number of days schools were closed. For future administrations a school calendar showing the days of operation should be obtained from the government and shown to participants to refresh their memory.

Table A 3: School Operation and Survey Dates

	Official school days per year	Initial and Final School Year Dates	Questionnaire Data Collection Period (midpoint used for analyses)	Approximate % of School Year Past at Midpoint of Survey Period
Pernambuco (Brazil)	200	First week of February – first week of December	July 2-August 31 (midpoint Aug. 1 2004)	About 102 days passed, or 51% of the time [10-16 July holidays]
Ghana	197	September 16-August 5	October 25- November 30, 2004 (midpoint Nov. 13)	About 42 days passed, 22.8% of the time
Morocco	204	September 8 -June 30 (2nd Wednesday of September)	November 29-December 7 2004 (midpoint Dec. 3)	About 75 days passed, 36.8%
Tunisia	190*	Sept. 15-June 30	May 24-29 2004 (midpoint May 26)	About 162 days passed, 87.4%

**Note*: Tunisian schools are open 160 days for grades 1 and 2, but higher grades were observed, and teachers of lower grades must be present in the entire school year. Of 190 days.

Stability of survey measurements. Surveys were conducted only once and at uncontrolled periods of time. However, if the sources of error are random, findings may be consistent across time. One opportunity for verification came with a 40-school sample in Pernambuco almost a year after the original survey (see Table A-4). Although there was some variance in the components, overall time loss was about the same as that of the 180-school sample. The 2005 EDUCA survey in the Dominican Republic that involved three monitoring visits showed that the time schools dedicated to learning was overall the same, 64-64%. Similarly the USAID-financed Ghana study found teacher absenteeism rates to be about the same during repeat visits.

Table A 4: Instructional time loss estimates from observations in 40 Pernambuco schools

Teasons for Time Loss	**Projected to Year-End**	
Number of school days	200	**Comments**
Delayed start of school	0.58	18 classes did not start for 21.3 days
Classes canceled after start	1.83	mainly due to a strike
Teacher absenteeism	25.49	observed as 12.9%
Teachers late to class	1	average 5.8 minutes
Early departures, class ending	0.29	average 1 minutes
Days Lost	29.19	
Percentage of Loss	14.60%	
Days Remaining	170.81	
Engagement Rate in Interactive or Passive Classroom Tasks	72.10%	Classroom Snapshot results
School Days Devoted to Learning	123.15	
School Year % Spent Engaged in Learning Tasks	61.6%	

(b) Stallings Classroom Snapshot. Use of time in the classroom was assessed through the Stallings Classroom Snapshot. The same sampled schools were used. The observed classrooms and teachers were drawn form a number of grade levels and a variety of subjects (Table A-5).

There have been many instruments and attempts within the field of teacher observation. Many of the observation instruments developed over the years are qualitative, require personal interpretation, and often rate variables on Likert-type scales (e.g. classroom climate is poor, moderate, excellent). There have been few examples of quantitative instruments or attempts to compare time profiles[135] with normative, actual patterns of time allocation, and the ability to give feedback to teachers and school authorities.

Table A 5: Sampled school locations by country – Snapshot in specific grades

Country	Number of Districts	Number of Schools	Number of Teachers	Number of Observations	Grade Levels	Length of Period
Tunisia	6	24	150	600	1,2,4	50
Morocco		15	197	394	1,4,6	50
Ghana	23	54	407	407	1,2,3,4,5, 6	30
Brazil	49	180	539	539	2,4,8	50

Note: subjects observed through the Snapshot were: Tunisia - reading, language, math, science, social studies, other; Morocco - reading, math, science, other; Ghana: math, English grammar, Ghanaian grammar, science, environmental studies, religion; Pernambuco: Portuguese, math, science, geography, religion.

The Stallings Observation System, often called C*lassroom Snapshot* is a "low inference" observation system used in a number of teacher and school effectiveness studies.[136] Observers trained through a five-day detailed process take a "snapshot" of classroom events every five minutes. They note codes related to various events on a one-page matrix (Annex B-1). This rather complex instrument measures the incidence of about 52 variables that include activities, interactions, materials used, and instructional strategies by teachers and students. Thus, in addition to documenting how time is spent in a class, the instrument records events related to quality of education. Through extrapolation, it is assumed that the same event that has been "photographed" will continue for the next four minutes, although this does not necessarily happen. For the study, an observer stayed in the classroom for an entire hour and produced 10 "snapshots" that sampled classroom events.

The Stallings Observation System was initially developed to measure the level of teachers' implementation of twelve early childhood and elementary school Head Start and Follow Through models, and was modified in 1977 for secondary school classrooms. The system consists of two independent observation systems, the Five Minute Interaction and the Snapshot, both of which use time sampling. The Five Minute Interaction observations are coded in five minute periods while in the Snapshot, any interaction is

135. Karweit 1988

136. e.g., Anderson, Ryan, & Shapiro, 1989; Goodlad, 1980; Stallings & Kaskowitz, 1974; Teddlie, Kirby, & Stringfield, 1989. "Low inference" means that the observations are recorded as seen, with little personal judgment and interpretation necessary.

coded at the moment, as if a picture were being taken.[137] To develop the instrument, Stallings made detailed observations about the presence or absence of the desirable and less desirable behaviors in a class, invited teachers to comment, and then observed them in the fall, winter and spring semesters. Some teachers were placed in the workshop group (experimental group) and others were not (control group). For the most part, the treatment teachers changed their classroom behaviors and distributed time across the recommended activities. Stallings reported that their students gained, on the average, six months more in reading than did the students of the control group teachers. Further observation indicated that treatment teachers maintained most of their behavior changes, whereas control teachers' classes became more lax and less task-oriented.[138] Similarly effective were efforts in secondary school.[139]

Studies helped establish benchmarks for effective use of time in classrooms in the US. [140] Most teachers monitored students doing written work at their seats for 50% of the time, did organizational activities for 38% of the time, and actively instructed students only 12% of the time. On the other hand, effective teachers distributed their time so that 50% or more class time was spent in active instruction, 35% in active monitoring, and 15% or less in organizing and managing. In average classrooms, students were actively engaged in their work only 15% of the time and were off task 85% of the time. But in the most effective teachers' classrooms the students were engaged 94% or more of the time and were only off task 3% of the time. These data helped establish benchmarks for time use in classrooms that were used to some extent as reference points in the study.
Snapshot data are summarized as amount of class time spent on three composite variables (interactive instruction, passive instruction, and organization-management) and student off-task rates. Based on empirical research, the test developer recommends that 50% or more of class time be spent in interactive instruction, because in US studies interactive time was found to increase test scores.[141] Passive instruction includes seatwork and copying should take up no more than 35% of class time. Passive instruction can be used judiciously to have students review what they have learned, but repetitive work may result in inattentiveness and limited new learning. Organizing and management include giving directions, dealing with intrusions and visitors, and such activities as taking roll and lining up for a fire drill. These elements of the class should take up no more than 15% of class time. It is normal for students to stop paying attention at some point in time, but observed student off-task behaviors should not exceed 6% of the time.

The study adapted the Snapshot for use in low-income classes outside the US; in particular, a category of copying was added to activities and codes related to discipline were de-emphasized. The developer did not did not foresee the possibility of teachers leaving the classroom unattended (which in the US is illegal) but this was observed frequently in other countries, and a category was added to describe a teacher out of the

137. Kurz 2003; not used in the current study
138. Stallings 1975, 1980
139. Stallings, Needles, and Stayrook, 1979; Stallings 1985, 1986
140. Stallings 1986
141. Schaffer et al., 1992; Stallings, 1980; Teddlie et al., 1989.

room or disengaged from students.[142] The instrument and manual were translated into French and Portuguese prior to training and reviewed by language experts and educators for accuracy. The five-day training included practice in coding vignettes of potential classroom activities and two days of classroom observations and coding practice. About 25 people were trained in each country. In Morocco, Tunisia and Ghana, trainees were inspectors or pedagogical advisors, and in Pernambuco they were university students; participants had to demonstrate competency in scoring and comprehension of the instrument's principles, and were certified.

Data from the snapshot were initially entered into a program using Microsoft Access. However, the software was found to be inadequate for large-scale use, and new software was developed with grant funds and piloted in India on an activity that was not financed by the grant. Further modifications are being made as the needs are better understood.

The training provided on the classroom Snapshot proved very popular, and many supervisors realized that they could use the same parameters in their everyday work. On the downside, one-hour observations were time-consuming. Also, repeated training was necessary to clarify the doubts that some participants had regarding the coding use. (Efforts have been made to simplify the instrument.)

A principal components factor analysis with varimax rotation on a dataset with all countries merged showed 19 factors with eigenvalues above 1.00. This large number was to be expected, since that this instrument measures many variable that have relatively low intercorrelations. (Though some were as high as 0.85, most ranged from 0 to 0.5). Several of the Snapshot variables had significant loadings (> 0.30) in more than one factors. The largest factors were related to (a) off-task behavior and management, (b) interactive instruction and not seatwork, (c) reading, books, and instruction, (d) teaching materials other than books, (e) copying, assignments, and seatwork, (f) group size and cooperative learning, and (g) teacher management activities. Factors 1 and 7 seem to measure the obverse, with many factor loadings negative on one and positive on the other. Three variables of low incidence did not have significant factor loadings, and two of these that pertain to other adults in the class have been removed from future administrations.

Data Analyses, Challenges, and Solutions

Data were analyzed in the field as well as at the World Bank. The Tunisian CNIPRE and the Secretariat of Education in Pernambuco submitted reports with analyses of their respective datasets that have been included in the analyses presented in this report. The World Bank team carried out additional analyses on the data of all four countries. To make them compatible, certain procedures and assumptions were used. Although they magnified measurement error, they were the only means to compare time loss across countries. Parametric and multivariate statistics were calculated with some variables after ascertaining that normality and homoskedasticity assumptions had not been unduly violated.

142. "Teacher out of the classroom" was added after this problem was observed in Brazil, but later it was modified as "teacher alone" to describe a teacher who was not interacting with children: sitting and grading tests or something else, writing lessons on the blackboard.

Recodes to create interval-scale data. In some countries, questions asking for specific numbers had been converted to ranges with open ends. (For example, the number of days schools were closed was often coded as 1 for 1-3 days, 2 for 4-7, days, and 3 for 7 or more). In those cases, the items were recoded; the midpoint and frequency of the ranges were used to calculate weighted averages and use them in further analyses. On some occasions it proved impossible; the school codes and some data on school closures of Tunisia had been entered incorrectly and could not be analyzed properly.

Corrections and assumptions for survey administration dates were as follows:

Governments administered surveys after deliberations lasting several months and at a time convenient to them. The team was apprised of the dates, but it was not possible to control in advance which day and time of the year the surveys were administered. To arrive at a specific number of days lost based on the responses, the team calculated the median date of the periods that surveys were administered in each country and projected respondents' answers to the end of the school year based on the fraction of school days that had already passed. [143] (See more details in Annex B-4). An assumption was made that the percentage of wasted time would be the same for the remaining school year, that variations would be would be randomly distributed, and that surveys were equally likely to be filled at any day of the week. This was important because absenteeism rates may vary during the week; in Pernambuco absenteeism could be 55% higher, depending on the day (Figure A-4). However, on many surveys the exact date was not noted, and the potential bias could not be estimated.

- Different countries have different blocks of vacations interspersed, but it proved difficult in some of them to get a clear number of school days past as a function of the school calendar at the time the surveys were given. For that reason, the 180-200 school days were assumed to be interspersed evenly in the course of nine months. Corrections were then made to the data. For example, Tunisian principals stated that schools had closed for about 4.50 days, but this happened near the end of the school year, while countries reporting fewer days did so closer to the beginning of the school year.

- Early departure was meant to measure instances of teachers dismissing their last class early and leaving the school, but due to a lack of clarity in the relevant survey questions, early dismissal was calculated for every class; where actual early departure times were unavailable, a 5-minute period was assumed. (Future surveys will provide clearer definition of what is meant by teacher early departure.)

Triangulation of responses and computation of time loss involved the following processes:

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143. Brazil expects 800 teaching hours (20 hours per week) in grades 1-4, and 1000 grades 5-8. Tunisia expects 160 days for grades 1-2 (704 hours in 32 weeks of 22 hours each) and 190 days for grades 3-6. Grades 3-4 have 800 hours in 32 weeks of 22 hours each, while grades 5-6 have 960 hours. Aside from there days the system has about 48 days of holidays. Schools in the Tunisian Priority Education Program have an additional two hours of work a day plus remediation for all students. In all cases, the teachers must be there for 190 days.

Efforts were made to capture and calculate various segments of time lost. Spreadsheets were developed to compare the frequencies of similar survey answers among the principals, teachers, students, and parents of each country (and ultimately across countries). Variation among responses was studied on the issues of school closures, attendance, tardiness, homework, and reasons for absenteeism. Reports about time loss in the previous year were also compared with those of the current year. Then algorithms were developed to estimate the various sources of time loss reported by the various stakeholders, and variability of comparable measures was studied. Averaged across schools within a country, it was found that various stakeholders differed relatively little in their estimations of time loss from a particular source. The time loss averages are shown in Table 1 of this report.

In a country or district some schools or just some classes may fail to start on the appointed day. Some sections may start and stop for a period due to teacher reassignments or other issues. To calculate the percentage of time lost through small segments, the concepts of school-days and class-days were used. Based on the number of official school days, the numbers of existing classes were multiplied by the number of days they should be functioning, and the amount of time lost by specific grades in specific schools was deducted. (If only schools were involved in a question, then school-days were used.) This method was used when the questionnaires obtained more specific information, as in Pernambuco. It was also used to calculate the amount of time teachers were delayed or dismissed classes early. For example, 17.5% of Moroccan teachers were reported to be late for 9.8 minutes coming to school. This amounted to a 3.4% loss of a 50-minute hour if spread among all teachers. To calculate the number of days lost, the percentage was deducted from the number of days schools were open and teachers present.

Time losses were added up. The number of days lost and reported teacher absenteeism were projected as a percentage of time given the number of days in the school year already past at the time that surveys were conducted (see assumptions section above.) Losses were computed in each case by deducting various numbers from net number of days available. When schools are closed, fewer days are left. So, teacher absences were calculated as a function of the days schools were open. Also, teachers cannot be late when schools are closed or when they are absent, so delays were calculated on the number of days schools were open and teachers present. (For subsequent surveys a computer program may be needed to make such calculations.)

The *Classroom Snapshot data* were in the form of percentage of scans that showed a certain characteristic (scans were usually 10 unless a class started late or was dismissed early). Thus, they had a minimum value of 0 and a maximum of 100. (Teacher activity data summed to 100% of time calculations, whereas student activity data were dependent on the size of the group a teacher was addressing.) Some non-parametric statistics were carried out, but most of the time the data were treated as parametric. The Snapshot data were at the teacher level and included a few classroom-related variables. To these, school-level questionnaire replies were linked and were used for various analyses. The Snapshot data had the same format across countries, so they were analyzed comparatively to compare performance among countries and among selected grades.

This section discusses the output produced by the classroom Snapshot, with a focus on the major activities taking place in class, how the teacher is addressing the students (whole group, small group, one-on-one instruction), and what materials, if any, are being used. Emphasis was on recording teacher activities. (Student activities may be to some extent different, particularly if they work in groups or carry out independent work, but this does not happen frequently in the countries where the research took place.) Table A-6 shows the average overall performance of the observed classrooms in the participating schools on a country-by-country basis. Some classes have been shown to carry out a certain activity 100% of the time, though the maximum number is usually lower. Because activities change often, standard deviations are large, sometimes larger than the means.

Table A 6: Classroom Snapshot – Country-level Performance and Criteria

Composite Variable	U.S Classroom Criteria	Brazil %	Ghana %	Morocco %	Tunisia %
(Number of teachers)		539	410	197	150
Interactive Instruction	50% or more	**52.4**	**59.9**	**62.8**	**61.2**
Passive Instruction	35% or less	**19.6**	**10.3**	**19.9**	**25.6**
Total Instructional Time		**72.1**	**70.2**	**82.6**	**86.7**
Organizing/Management	15% or less	**27.9**	**28.0**	**17.8**	**13.3**
Student Off Task Rate	6% or less	**19.3**	**21.1**	**9.2**	**9.9**

Key
10% above recommended *minimum* for interactive instruction
Above recommended *minimum* for interactive instruction
Above recommended *maximum* for organizing, management and Student Off Task Rate
10% above recommended *maximum* for organizing, management and Student Off Task Rate

Interactive (active) instruction. This includes reading, explanation, discussion, practice drills, and kinesthetic exercises or projects. Brazil and Ghana reported over 50% interactive instruction while Morocco and Tunisia reported over 60%. Although this seems encouraging, this category includes lecturing, which if it goes on past a few minutes turns into "passive" instruction. The instrument does not distinguish well among shorter and longer periods of lecturing.[144]

Passive instruction refers to students doing individual work seated at their desks. It includes teacher's monitoring of seatwork and copying, and is often related to lower achievement. This is why it is recommended that no more than 35% of the time be spent in it. However, some practice is necessary particularly in math, and the time may be well-used if insight rather than repetition is promoted in solitary study. Students spent a low 10.3% of their time in such activities in Ghana and a high 25.6% of the time in Tunisia.

Students' engagement rates. The figures of interactive and passive instruction combined give the total percentage of time that students are engaged in learning activities. In Morocco and Tunisia figures are in excess of 80% while in Brazil and Ghana they are just a bit above 70%. Thus, Ghanaian classes give students about 16% less instructional time than Tunisian classes.

144. Student activities in Tunisia, where teachers control classes, closely followed teachers, but they may not be elsewhere. However, this aspect of the Snapshot was not sufficiently discussed in the research.

Organization-management. This remaining time is strictly speaking not instructional, though it may involve necessary tasks such as instructions for the next day or notebook delivery. Activities may also involve social interactions among teachers and students[145] or describe a teacher who works alone, does not interact with students, or may have left the room. Such activities should take up no more than 15% of the time. Of the four countries, only Tunisia is below 15%, while students in Ghana and Brazil spend about 28% of their class time in such 'management' activities. Teacher alone rates were almost zero in Tunisia and 4% in Morocco, but they rose to 12% in Pernambuco and 15% in Ghana. This implies time spent in activities that involve no teacher feedback and monitoring.

The relationship between discipline, management activities and instruction is apparent when the Snapshot data of all countries are analyzed together. Discipline and off task behavior were correlated 0.30; management was correlated 0.43 with off task behavior and -0.59 with interactive learning (Table A-21). Also averaging activities across snapshots and producing correlations makes it possible for large patterns to emerge. Management correlates highly with students being disciplined (r=0.73) and practice drill (0.86), but highly negatively with assignments (r= -0.93) because the teacher is busy. Copying is an opportunity for classroom management (r= -0.55) and social interaction by students but also for reading (r=0.64).

Despite the variability and particular circumstances of different countries, the concepts of interactive and passive use of time, management, and student off-task rates have consistent relationships among them (Table A-7).

Table A 7: Relationships between categories of time use in the Classroom Snapshot

Cross-Country Correlation	Teacher Reading	Instruction	Student off-Task	Interactive Learning	Passive Learning	Management
Teacher reading	1	-0.28	-0.14	0.31	-0.12	-0.23
Instruction	-0.28	1.00	-0.05	0.38	-0.18	-0.25
Student Off Task	-0.14	-0.06	1.00	-0.24	-0.21	0.43
Interactive learning	0.31	0.38	-0.24	1.00	-0.56	-0.59
Passive learning	-0.12	-0.18	-0.21	-0.56	1.00	-0.30
Management	-0.23	-0.25	0.43	-0.59	-0.30	1.00

**significant at the 0.01 level (2-tailed).
*significant at the 0.05 level (2-tailed).

Note: N=1651

Students off-task. This very important variable of the Snapshot is computed separately and on the basis of visual observations of students who seem uninvolved with classroom activities. (More psychophysiologically direct means of assessing involvement are beyond reasonable cost or ease of use.) It estimates the number of person-minutes

145. In the US children have discipline problems, so social interaction variables are important.

wasted in a class (e.g. 50 students unengaged for 20 minutes). In all countries of the study, the off-task behavior among students is above the 6% recommended maximum. However, Morocco and Tunisia have rates around 9%, (with socializing a low 3% and being disciplined 1% in Tunisia) whereas in Ghana about 21% of the students appear not to pay attention to the classroom proceedings.

An absent-minded student is probably not learning, so off-task behavior reflects involvement in learning and has been used as a proxy for learning in some studies. High levels of off-task behaviors are found in classrooms with low performance on tests. Further more, there is a relationship between student off-task behavior and teacher management activities. Classrooms with lower rates of instruction tend to have higher rates of off-task behaviors. This may happen in part because often several minutes pass in each class before instruction begins or tasks change, and during that time students high rates of off-task behavior. In Ghana, for example the teacher was disengaged from students 15% of the time and organized teaching for another 10% of the time, while students were off task 21% of the time. In Brazil teacher off task correlates 0.47 with student off task rate.

Off-task rates are certainly related to classroom activities (Table A-8). In Pernambuco the three classes with the highest percentage of reading time (67%) had off task rates of about 10%; by comparison, the five classes that spent no time in reading had off task rates of 83%. In Tunisia where off-task rates are lower and time used efficiently, correlations with activities tend to be lower due to the restriction of range.

Table A 8: Correlations between Student Off-Task and Engagement in Instruction

Correlation with	Interactive	Passive	Management	Teacher Off-task	No. students in class	Average class size (range
Pernambuco	-0.18	0.23	0.49	0.46	-0.25	25 (3-65)
Ghana	-0.41	-0.15	0.30	0.33	-0.01	26 (2-82)
Morocco	0.08	-0.06	0.05	0.03	0.06	31 (18-55)
Tunisia	-0.17	0.0	0.11	0.22	-0.14	26 (11-40)

Source: Stallings 2006

In Ghana there are few books, or paper and pencils necessary for seatwork, so the teachers may rely more upon class discussions. According to the Ghana USAID study, only 63.7% of the teachers were following the approved timetable – a proxy for curricularly relevant time. Twenty-three percent of the teachers do not have lesson plans, and of the 77% who do, 35% do not use them. They teach "off their heads", risking disorganization. The teacher disciplining variable was an average of 1.3% indicating that the misbehavior was going unchecked. Similarly, in Pernambuco, the highest off task variable in all grades was socializing among students, 12% of the time. However, the "student disciplined" variable is a low 2%, indicating that teachers rarely stop the off-task behavior (Stallings 2006).

Stability of Snapshot measurements. It is reasonable to expect that the amounts of time involved in various class activities would change from hour to hour (one reason why variance of time parameters within schools is greater than variance between schools.) However, initial studies with this instrument showed considerable stability (Stallings and Kaskowitz 1974). Similarly, in Morocco and Tunisia, correlations between the first and second administration to the same teachers showed moderate but significant correlations (Tables A-9, A-10). The highest correlations involved management and student off task behaviors. This suggests that some teachers systematically use time more or less efficiently and commensurately their students pay attention less or more. With the Snapshot data at hand, teachers can receive feedback and training.

Table A 9: Morocco - Correlations between Repeated Observations of Same Teachers

	1st Observation Mean	2nd Observation Mean
Interactive Instruction	61.35	63.76
Reading	13.15	18.0*
Instruct Explain	26.89	26.21
Discussion	6.19	6.94
Practice Drill	13.59	11.04*
Kinesthetic	0.41	0.20
Projects	0.30	0.71
Passive Instruction	20.59	19.44
Monitoring Seatwork	16.13	13.92
Monitoring Copying	4.46	5.52
Organizing Management	18.42	17.31
Giving Assignments	6.58	6.08
Managing with Students	9.17	8.91
Disciplining Students	1.41	1.07
Managing Alone	0.10	0.24
Student Off Task Rate	9.22	9.34
Being Disciplined	4.17	4.54
Socializing	4.08	3.87
Uninvolved	0.97	0.97

Some studies ask teachers to self-report on how they spend classroom time. Tunisian teachers were asked during the survey. As might be expected, interactive time was overestimated at 69.4% compared to the real average of 61%.

Classroom observers coded the Snapshot with reading activities mainly when the teacher used books, (r=0.39), but did not usually code activities as reading when the teacher used chalkboard or students used notebooks. Also, independent student activities involving reading were not analyzed in sufficient detail. Since some students must have been reading

the written contents, the possibility arises that reading activities were underestimated through the Snapshot.

Table A 10: Correlations between repeated observation sessions

	Interactive instruction	Passive instruction	Organizing/ Management	Student off Task	Reading	Seatwork	Copying	Instruction	Discussion
Morocco	0.21	0.19	0.31	0.04	-0.12	0.18	0.21	0.39	0.41
Tunisia	0.32	0.16	0.46	0.26	0.26	0.19	0.37	0.44	0.38

Table A 11: Average percentages of Time Use in 4th Grade

Country	Discipline %	Student off Task %	interactive learning %	Passive learning %	Organization-management %
Pernambuco	1.75	18.21	52.89	18.61	28.50
Ghana	1.44	25.92	52.50	12.50	35.00
Morocco	4.20	9.37	62.85	20.03	17.78
Tunisia	0.88	9.64	61.70	26.32	11.98

Table A 12: Ghana average percentages of time use by location

Location	*Rural*	*Peri-urban*	*Urban*
Interactive	59.2	59.5	63.6
Reading	9.8	6.03	6.3
Instruction	19.2	20.2	22.9
Discussion	22.9	26.6	26.7
Practice Drill	6.3	6.0	7.7
Passive	9.7	12.1	10.5
Seatwork	6.8	9.5	8.8
Copying	2.9	2.6	1.7
Management	27.7	28.1	263
Total engaged time	68.9	71.6	74.1
Student Off Task	21.1	19.9	22.0

Table A 13: Morocco average percentages of time use by location

Location	*Rural*	*Urban*
Interactive	62.6	63.4
Reading	15.8	16.1
Instruction	28.7	24.4
Discussion	6.8	7.4
Practice Drill	9.9	14.1
Passive	21.3	18.3
Seatwork	15.4	14.2
Copying	5.8	4.1
Total Engaged Time	83.9	81.7
Management	16.8	18.6
Student Off Task	9.6	8.7

Table A 14: Pernambuco average percentages of time use by location

Location	*interior*	*peri-urban*	*urban*
Interactive	57.5	48.5	49.0
Reading	8.3	5.1	5.9
Instruction	37.5	29.1	28.7
Discussion	6.9	6.0	5.5
Practice Drill	1.8	1.3	0.8
Passive	19.3	20.8	17.1
Seatwork	16.7	17.8	13.2
Copying	2.6	3.0	3.9
Total Engaged Time	76.8	69.3	66.1
Management	23.2	30.7	34.5
Student Off Task	16.2	21.1	24.3

Table A 15: Pernambuco Average Percentages of Time Use by Grade

Grade	*2*	*4*	*8*
Interactive	52.9	52.8	51.8
Reading	7.8	7.9	4.3
Instruction	30.2	31.0	37.1
Discussion	5.9	7.1	5.8
Practice Drill	2.2	1.4	0.7
Passive	16.0	18.8	23.2
Seatwork	13.5	16.6	18.9
Copying	2.6	2.2	4.3
Total Engaged Time	68.9	71.6	74.0
Management	31.1	28.4	25.1
Student Off Task	22.6	18.5	17.8

Table A 16: Ghana Average Percentages Of Time Use By Grade

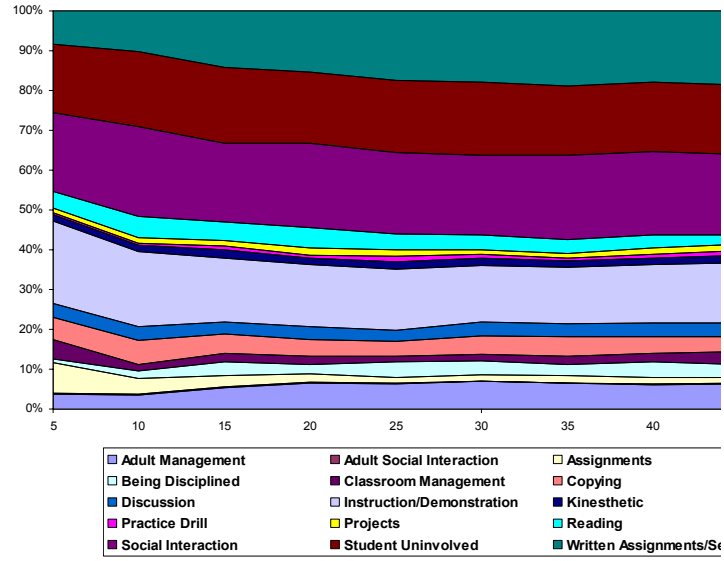
Grade	*1*	*2*	*3*	*4*	*5*	*6*
Interactive	71.1	58.6	50.0	57.5	50.2	62.4
Reading	14.4	10.4	8.8	16.3	4.1	6.7
Instruction	16.7	18.8	16.3	11.3	17.0	22.4
Discussion	20.6	21.4	22.5	26.3	24.2	27.6
Practice Drill	16.7	7.3	2.5	3.8	4.1	5.2
Passive	4.4	10.5	8.8	17.5	14.3	9.6
Seatwork	3.9	7.4	2.5	11.3	11.6	7.1
Copying	0.6	3.1	6.3	6.3	2.8	2.6
Total Engaged Time	75.5	71.1	58.8	75.0	64.5	72.0
Management	23.3	29.0	38.8	25.0	33.1	26.1
Student Off Task	19.7	24.7	26.5	21.3	23.8	16.6

Activity changes in an instructional hour

Activities in class do not take place at random; there are sequences that sometimes differ from one country to another. Figures 8-10 show the flow of various activities in Tunisia, Ghana, and Pernambuco. (It was not possible to conduct this analysis for Morocco.) Students tend to be off task more frequently in the last parts of the hour. There does appear to be engaged in seatwork more towards the end of the class period while instruction is more frequently observed in the beginning of the class (see Figure A-10 for Tunisia). This is one reason why it was important to observe an entire hour and take snapshots rather than visit classes at some point during the period.

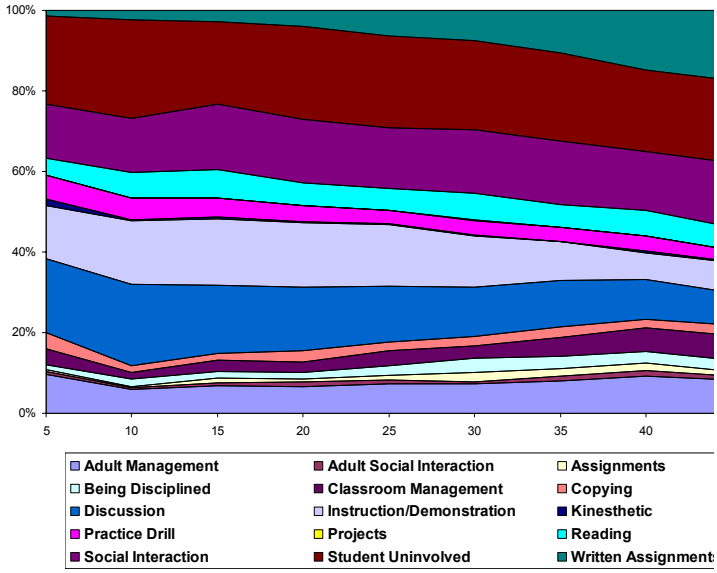
Correlations between the serial number of snapshots and various activities confirm the tendency for drill, adult management and seatwork to be done towards the end of the period. Classes in Ghana lasted only 30 minutes, and this may be one reason why management takes up so much time compared to other activities. Also reading along with instruction takes place earlier in Ghana.

Figure A-1. Activity Changes in Brazil



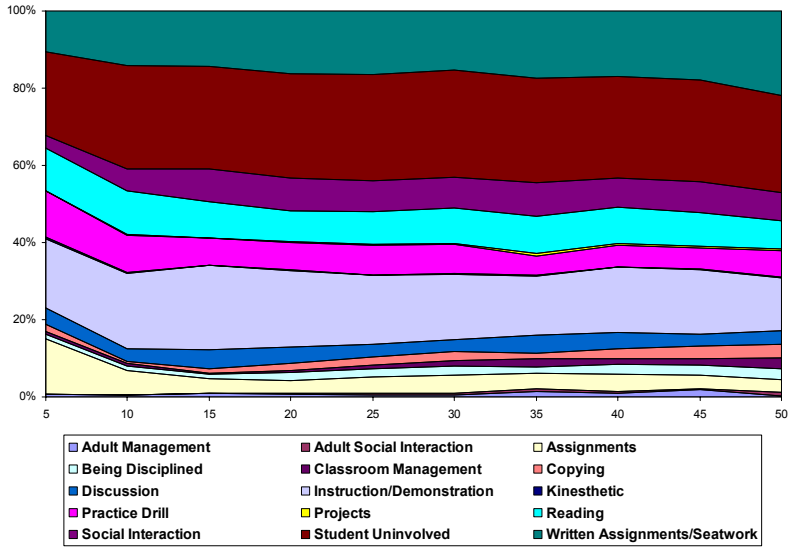
Note: Each row in the table is a snapshot, and each column is an activity. The intersection of the row and column is a count of that activity during that snapshot. This table shows the trend of activities over time.

Figure A-2. Activity Changes in Ghana



Note: class time in Ghana lasts 30 minutes

Figure A-3. Activity Changes in Tunisia



Note: Each row in the table is a snapshot, and each column is an activity. The intersection of the row and column is a count of that activity during that snapshot. This table shows us the trend of activities over time

Annex B. Survey Forms and Instructions

B-1. Classroom Snapshot

This form is one snapshot. Ten snapshots are produced for each class hour.

Snapshot 1 T: Teacher A: Other Adult I: Individual

Number of Adults Present ____ Nunber of Students Present ____

MATERIALS

ACTIVITY		Books	Notebk	Chalk board	Comput. / Calc.	Manip-ulative	Visual Aids	Co-operative	None
Reading	**T**	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E
	A	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E
	I	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E
Copying	**T**	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E
	A	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E
	I	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E
Assignments	**T**	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E
	A	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E
	I	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E
Instruction/ Demonstration	**T**	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E
	A	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E
	I	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E
Discussion	**T**	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E
	A	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E
	I	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E
Practice/Drill	**T**	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E
	A	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E
	I	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E
Written Assignments/ Seatwork	**T**	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E
	A	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E
	I	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E
Kinesthetic	**T**	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E
	A	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E
	I	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E
Projects	**T**	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E
	A	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E
	I	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E	1 S L E
Social Interaction	**T**								1 S L E
	A								1 S L E
	I								1 S L E
Student Uninvolved	**I**								1 S L E
Being Disciplined	**T**								1 S L E
	A								1 S L E
Classroom Management	**T**								1 S L E
	A								1 S L E
	I								1 S L E

Adult Social Interaction TAA **Adult Management** T AA

B-2. Basic Skills Teacher Profile – General

Values are calculated as follows:

Teacher			US Criteria
	Active Instruction		50% or more
		Reading	
		Instruction/Explanation	
		Discussion	
		Drill and Practice	
		Kinesthetic	
		Projects	
	Passive Instruction		35% or less
		Monitoring Copying	
		Monitoring Seatwork	
	Classroom Management		15% or less
		Giving Assignments	
		Managing with Students	
		Disciplining Students	
		Managing Alone	
	Off-Task	Socializing with Students	0%
		Socializing with Others	
Students			
	Off-Task	Being Disciplined	6% or less
		Socializing	
		Uninvolved	

B-3. Classroom Snapshot Activities as used in 2004-2005

Code Item	Description
Academic Activities	
Reading Aloud/Oral reading	Students are reading aloud One or more students are reading connected text from a text, trade book, periodical, their own writing, or reproduced material. When reading aloud, generally students take turns reading sections from the material. The teacher or student may also read aloud while the rest of the class follows along in their own texts. Although one person reads at a time, all students are coded as engaged in the oral reading activity with the teacher. Code this over the T using the 1, S, L, or E code. Use Books in conjunction with Reading Aloud. If students are reading a play aloud and are working together in order to make a presentation, code Reading Aloud in conjunction with Cooperative Groups (i.e.: students rehearsing for a Readers' Theatre presentation). Reading in unison is also coded here.
Copying	Students are copying work or exercises from the chalkboard. The primary purpose of the activity is to transfer the text on the board verbatim to the students' paper or copybooks. If students are interacting with the material to learn or practice concepts or procedures or to apply knowledge (work math problems, conjugate verbs), then code under Written Assignments/Seatwork. When the teacher is copying on the blackboard and the students are copying at their seats, code the teacher in the Classroom Management Alone. When the teacher is monitoring while the students are copying, code the teacher with students under Copying.
Receiving Assignments	The teacher is explaining an activity, the procedures to be followed, the amount of work to be finished, or rewards for completing the assignment. The discussion is not focusing on the academic content, but on the information that students need to carry out the assignment. Discussion of grades and clarification of behavior expectations is coded here.
Instruction/Demonstration	An adult or some form of media is informing some grouping of students about a subject. Code this category also if a teacher models a procedure or shows students how to do something (e.g., science experiment, math problem, use of materials).
Discussion	Academic discussion, verbal exchange, or slow-paced question/answer session takes place regarding the lecture material, assignments, or problems. This code may be used in conjunction with Cooperative Groups, to show that a cooperative group is discussing an assignment.
Rote learning/Practice/Drill	One or more students are verbally involved in reinforcing, repetitive, or rote work. For example, learning definitions or answers to given questions, or any text, Verbal and manipulative games which give further practice in using a learned concept are coded here.
Written Assignments/ Seatwork	One or more students are writing papers, doing computation, or are involved in any other silent written work. If a student is writing and reading, use the Written Assignment activity. If the teacher is monitoring, code this activity in the T line using 1, S, L, or E. Written test taking is coded here. Please note in the Log when test-taking occurs.
Note: Whenever the teacher is actively monitoring or listening, the activity should be coded on the T line.	
Projects	Projects are hands-on activities that result in a product and can extend over one or more class sessions. Examples include constructing a bird house, painting a mural, making puppets, making a pottery bowl, or creating a book. Doing science experiments, agriculture, or shop also would be coded as a type of project. The Projects category may often be coded with Cooperative Groups when two or more people are involved in a joint project. Please describe any project in your Log.
Note: Whenever the teacher is actively monitoring or listening, the activity should be coded on the T line.	

Code Item	Description
Academic Activities	
Off-Task Social Interaction	Two or more students are interacting about work or subjects other than class-related activities. This would include physical or negative interaction between or among students that disrupts the class.
Uninvolved/No Activity	This category is recorded when one or more students are not involved in instructional activities. If the teacher has not specified an instructional activity then this will be recorded by placing an E (Everyone) in the T column under "None" in the materials column. Code students who are arriving or departing as uninvolved. Code students who are waiting for the teacher in order to begin an assignment or take an exam as uninvolved.
Being Disciplined	One or more students are being reprimanded for their behavior or are being sent out of the room for disciplinary reasons. This may include corporal punishment. When corporal punishment occurs please record the incident in the snapshot log.
Classroom Management with Students	Adults and students are involved in classroom management: passing out papers, changing activities, putting away materials, preparing to leave. Mark No Materials. Even though materials are being handled, they are not being used. Coded on right hand side of form.
Classroom Management Without Students	(coded at the bottom of the form)
Adult Social Interaction	Two or more adults are interacting about subjects other than class-related activities. Circle the T for the teacher or A for other adult on the left-hand side of the form to indicate they are not working with the students.
Adult Social Interaction	Two or more adults are interacting about subjects other than class-related activities. Circle the T for the teacher or A for other adult on the left-hand side of the form to indicate they are not working with the students.
Adult Management	One or more adults are alone (without students) performing duties related to the classroom but not directly related to any activity which is occurring at the time of the Snapshot. Examples are a teacher correcting papers at his/her desk, copying material onto the board, setting up materials, or arranging books on a shelf. Circle the T for the teacher or the A for other adult on the left hand side of the form to indicate they are not working with students.
Note: The first ten activities reflect academic activities. The last four activities indicate students or adults who are not involved in an academic activity. When completing the Snapshot, first record adults and students involved in academic activities. Then record the students who are off-task or who are involved in management.	
Books	This category refers to printed materials that students do not write in directly. The Book category includes trade books, textbooks, anthologies, periodicals, students' own produced writing, and material copied from books or periodicals.
Paper/Pencil (notebooks)	This designation refers to consumable materials that students work with to develop concepts or skills and include notebooks, workbooks, worksheets, journals, sets or files of teacher or commercially prepared work, or blank sheets of paper on which students work problems, write answers, or write essays and stories. If students are copying work from the chalkboard onto their papers, use this category.
Chalkboard	Code this category when teachers or students are working at the chalkboard located in the classroom. Also code this category when students are using individual chalkboards at their seats.
Computer/Calculator	This category includes machines that are used for instruction and require students to employ more than one modality or computers or calculators that provide practice, drill, or instruction. Multimedia, such as film projectors, VCRs with monitors, CD ROM technology, and laser discs are included. Code audio-cassette tape recorders in this category. Please describe the machine(s) in your log.
Manipulables	Code this category for hands-on materials that provide instruction or practice. Any physical object that the student manipulates for learning is included. Rulers, compasses, and learning materials that students use to

Code Item	Description
Academic Activities	
	construct or create something are coded as manipulables. If students are using an abacus, code it here. Standard classroom materials such as pencils, crayons, or erasers are not coded here. They are coded under the Paper/Pencil category.
Visual Aids	Use this category to describe visuals that teachers use to accompany instruction and enhance student understanding. Visual aids include information written on the overhead projector, maps, charts, photos, posters, flipcharts, pocket charts, slides, or felt boards and other teaching learning materials. This category does not include the chalkboard – activities using the chalkboard should be coded under Chalkboard.
Cooperative Learning	Use this category when students work on an assignment in small groups toward a specific outcome. The assignment should have a final intended product, such as a mural, a revised essay, a group report, a map, a science experiment done as a group, something done in shop, etc.
No Materials/None	This is coded when materials are not being used. No Materials is always coded with the last four activities.
Coding Rules	
1. Teacher can be placed only once for each snapshot. 2. Do not code the students who are working with the teacher on a separate line – they are part of the teacher code. 3. One student or small groups of students or large groups of students can be marked more than once on the line.	

Note: subsequent modifications of this instrument have resulted in a slightly different variable list and definitions.

B-4. Calculations of Time Loss From Survey Data

Surveys asked the following comparable questions from principals, teachers, students, and in Morocco enumerators. The averages are listed below.

School Closure

- Brazil (Pernambuco): Excluding the days that were holidays in the school calendar, how many other days was the school closed (2004)? Principals = 2.19, Teachers = 2.70
- Ghana: How many days was the entire school closed last year (2003)? Principals = 3.21, Teachers = 3.11
- Morocco: How many days does the school have no classes aside from the official vacation during the current school year? During the previous school year? Principal (2004) = 0.59, Principal (2003) = 1.13
- Tunisia: How many days wasn't there class this year (2004)? Principal = 4.50

Teacher Absence

- Brazil (Pernambuco): How many teachers were missing today? Principals = 1.76
- Ghana: How many are absent today? Principals = 0.90 teachers
- Morocco: How many teachers are absent today? Principals = 0.60, Enumerator = 1.97 teachers
- Tunisia: How many teachers are absent today? Principals = 0.97 teachers

Teacher Delay

- Brazil (Pernambuco): How many teachers arrived late today? Principal = 1.19
- Ghana: How many teachers were late today? Principal = 0.83 teachers
- Morocco: Did you notice any teachers delay arriving to school? If yes, how many? Enumerator = 3.43 teachers
- Tunisia: How many teachers arrive late today? Principal = 0.02 teachers

Teacher Early Dismissal

- Brazil (Pernambuco): How many teachers left early yesterday? Principal = 0.64
- Ghana: How many teachers left before normal time of closing? Number extracted from USAid Study = 0.06 teachers
- Morocco: Did you notice any teacher's early departure from the classroom? If yes, how many? Enumerator = 0.68 teachers
- Tunisia: No data. Imputed from Morocco

Student Absence

- Brazil (Pernambuco): Since you began classes, how many days have you missed? Students = 3.99 days
- Ghana: Since the beginning of the school year, how many days were you absent from school? Students = 1.96 days
- Morocco: During the school year, how many lessons have you missed? Students = 1.59

- Tunisia: Since the beginning of the year, how many times were you absent? Students = 2.93 times

Student Delay

- Brazil (Pernambuco): Since you began classes, how many days have you arrived late? Students = 2.86 days
- Ghana: Since the beginning of the school year, how many days were you late in arriving in school? Students = 2.23 days
- Morocco: During the current school year, how many times did you arrive late to school? Students = 1.92 times
- Tunisia: Since the beginning of the year, how many times were you late? Students = 2.29

How Time Loss was calculated at Various Stages

The mid-point was calculated of the dates surveys were administered in each country and respondents' answers were projected to the end of the school year. The length of school day was included in calculations where it was absolutely necessary to do so, since there is considerable variation in school day lengths across schools. Finally, questions from two or more survey types were averaged when they provided the same information. The numbers of days teachers were absent or late were deducted from the number of days left after school closures.

Brazil (Pernambuco)

- School Closure: Average from principal and teacher (Principal average = 4.29, teacher average = 5.29 days)
- Teacher Absence: From principal (Principal = 12.76 days)
- Teacher Delays: From principal (Principal = 5.50). Teacher self reports on delays last month = 6.06 days. Assumptions for both: a 6.4 minute delay, 50-minute class period, and 5 hour school day
- Teacher Early Dismissal: From principal (Principal = 2.30 teachers). Teacher self-reports on early departures last month = 2.93 teachers. Assumption for both: a 5 minute delay, 50-minute class period and 5 hour school day
- Student Absence: From student (Student = 7.82 days)
- Student Delay: From student (Student = 5.61 days)
- Researcher found by calling schools that 26 of 180 schools started 15 days late. Average time lost was 2.175 days in the sample of 180 schools

Ghana

- School Closure: Average principal and teacher reports on closure last year (2003) (Principal = 3.22, teacher = 3.12 days)
- Teacher Absence: From principal (Principal = 43.01 teachers). Teacher self-reports on absence last year = 13.90 and student reports on teacher absence = 10.82 days
- Teacher Delays: From principal = 39.75 days (assuming 30 minute delay and 5.5 hour school day; both cited in Ghana's Time on Task report)
- Teacher Early Dismissal: USAid study cites that 1.5% of teachers depart early. Using those figures, Days lost = 2.42

- Student Absence: From student (9.04 days)
- Student Delay: From student (10.610 times)

Morocco

- School Closure: Average of two principal questions on school closure (in 2004 = 1.62 and 2003 = 1.13 days)
- Teacher Absence: Average principal and enumerator question on absence in school on survey date (Principal = 6.19, enumerator = 20.53). Note that teacher self report on absence = 11.67 and student reports on teacher absence = 9.79 days
- Teacher Delays: From enumerator = 6.94 days.
- Teacher Early Dismissal: From enumerator There was a very low response rate to this question. Average early departure time = 9.58 minutes
- Student Absence: From student (4.30). Parents report = 26.235 days from one-week averages that was not used.
- Student Delays: From student (5.19 times)
- Data are available from the enumerator survey on teacher delay entering classroom, with an average delay of 7.83 minutes on average, resulting in losses of 4.88 days. Teacher delay entering classroom after break time = 3.184 days with average delay of 6.07 minutes

Tunisia

- School Closure: from principal (Principal = 5.15 days). Data file had errors. Average estimated from reasons Tunisian schools were closed.
- Teacher Absence: from Principal (Principal = 11.55). Teacher self-reports on absence last year = 11.28 and student reports = 11.28 days
- Teacher Delays: from principal (Principal = 1.27 days). Assumed 15 minute delay, 50-minute class periods, and a 5 hour school day
- Teacher Early Dismissal: No data. Imputed by projecting ratio of delay to departure in Morocco
- Student Absence: From students (3.35 days). Parents reported 7.65 days
- Student Delay: From students (2.63 times since the beginning of school year)

Annex C. Policy Discussion Exercise

Improving service delivery
Helping governments get what they pay for

Consider the country you are working on, look at the schematic and answer the questions below.

- How important are these factors in reducing schooling time as far as you know?
- What policy dialogue or public debate has taken place already?
- What aspects of policy dialogue were more and less successful?
- What decisions and activities are needed to deal with the factors reducing schooling time?
- Who is responsible?
- What expenditures will be needed to increase instructional time?
- What incentives might work at each level of time loss?
- Who might act as a champion?

Class time as allotted by a government: _____ hours or days

Remaining after school closures

Strikes
Weather
Building problems
Teacher training, study leaves
Extra holidays
Civil unrest-security
Other

Remaining after teacher absenteeism

Tardiness
Early departures
Longer breaks
Important illness issues? (HIV)
Other

Student absenteeism

Widespread illnesses
Need for work
Limited instruction-little need to attend
Other

Class time devoted to any learning task

Do supervisors/inspectors function?
Do principals supervise learning?
Are there textbooks for all?
Other issue?

Learning time relevant to curriculum

Class up to date with curriculum?
Students know prerequisites?
Other issue?

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