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Quality of Education in Madrasah

Main Study

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FINAL REPORT

Quality of Education in Madrasah:
Main Study

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The project commenced in April 2009 and was funded under the Australia-Indonesia Basic Education Program (AIBEP). It was a collaborative task undertaken by the Ministry of Religious Affairs (MoRA), Contractor Strategic Advisory Services (CSAS/AusAID), the Australian Council for Educational Research (ACER), the Indonesian University of Education (Universitas Pendidikan Indonesia; UPI); and the Basic Education Capacity Trust Fund (BEC-TF).

CSAS, ACER and UPI worked closely together during the design phase of the study – including decisions regarding the domains to be tested, instruments to be used, and sampling strategies. In addition, UPI took responsibility for developing the Indonesian language test and conducting a significant amount of the fieldwork. ACER supplied the initial instruments (with the exception of the Indonesian test), and had responsibility for amending and finalising those instruments. ACER was also responsible for entering, cleaning and analysing the data, drafting this report and finalising it with their collaborators. Overall management of the project was undertaken by CSAS.

Following two pilot phases involving the trialling of instruments and piloting of procedures, the main phase of the study began in September 2009, with support from the BEC-TF which is administered by the World Bank and funded by the Government of the Kingdom of the Netherlands and the European Commission.

This report is based on various instruments administered at 150 Islamic schools (Madrasah Tsanawiyah) during October and November 2009. The contribution made by the madrasahs, especially the Year 9 students, is gratefully appreciated. The findings, interpretations, and conclusions expressed herein do not necessarily reflect the views of the World Bank, AusAID, MoRA, CSAS, MDI, BEC-TF or UPI.

Cover Photo : Marbawi

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List of Acronyms

ACER	Australian Council for Educational Research
AIBEP	Australia Indonesia Basic Education Project (BEP)
AUSAID	Australian Agency for International Development
BEC – TF	Basic Education Capacity Trust Fund (World Bank)
BOS	Schools Operational Assistance Program (funded by the Central Government)- Biaya Operasi Sekolah
BPS	Central Bureau of Statistics - Biro Pusat Statistik
BSNP	National Education Standards Agency - Badan Standar Nasional Pendidikan
CEFLA	Competence in English as a Foreign Language Assessment
CEFR	Common European Framework of Reference for Languages
CSAS	Contractor Strategic Advisory Services
EBTANAS	National End-of-Level Examination (formerly used) - Evaluasi Belajar Tahap Akhir Nasional
EFA	Education for All
EFL	English as a Foreign Languange
HLM	Hierarchical Linear Modelling
IBT	International Benchmark Tests
IEA	International Association for the Evaluation of Educational Achievement
KKM	Madrasah Teacher's Working Group - Kelompok Kerja Madrasah
MGMP	Secondary School Subject-Based Teacher's Working Group - Musyawarah Guru Mata Pelajaran
MONE	Ministry of National Education
MORA	Ministry of Religious Affairs
MSS	Minimum Service Standards
MA	Islamic Senior Secondary School - Madrasah Aliyah
MI	Islamic Primary School - Madrasah Ibtidaiyah
MTs	Islamic Junior Secondary School - Madrasah Tsanawiyah
OECD	Organization for Economic Cooperation and Development
PIRLS	Programme for International Reading and Literacy Study
PISA	Program for International Student Assessment
PNS	Civil Servant - Pegawai Negeri Sipil
PSU	Primary Sampling Unit
QEM	Quality of Education in Madrasah
S1	Degree equivalent to Bachelor's Degree - Sarjana 1
SACMEQ	Southern and Eastern Africa Consortium for Monitoring Educational Quality
SD	Standard Deviation
SD	Primary School - Sekolah Dasar
SE	Standard Error
SMA	Senior Secondary School - Sekolah Menengah Atas
SMK	Vocational Secondary School - Sekolah Menengah Kejuruan
SMP	Junior Secondary School - Sekolah Menengah Pertama
SLQ	Student Life Questionnaire
TIMSS	Trends in Mathematics and Science Study
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UPI	Indonesian University of Education - Universitas Pendidikan Indonesia
USAID	United States Agency for International Development

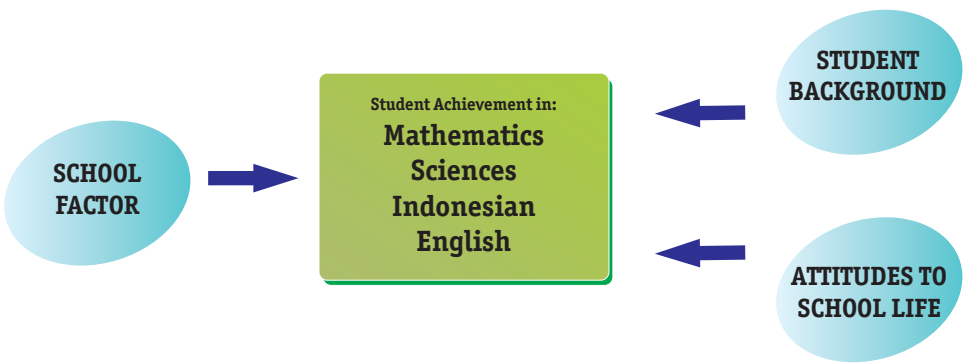
EXECUTIVE SUMMARY

The 'Quality of Education in Madrasah' (QEM) study aimed to provide high quality research into various dimensions of quality of education in Indonesian Madrasahs. The project commenced in April 2009 and was funded under the Australia-Indonesia Basic Education Program (AIBEP). It was a collaborative task undertaken by the Ministry of Religious Affairs (MoRA), Contractor Strategic Advisory Services (CSAS/AusAID), the Australian Council for Educational Research (ACER), the Indonesian University of Education (Universitas Pendidikan Indonesia; UPI); and the Basic Education Capacity Trust Fund (BEC-TF).

METHODOLOGY

The study focused on final year students in Islamic Junior Secondary Schools (Madrasah Tsanawiyah, MT). One hundred and fifty MTs were sampled from across Indonesia, with equal numbers selected from Java and the East and West of the country. Systematically selected intact classes were sampled within schools, involving a total of 6,233 students.

Eight instruments were developed for use in the study. Four were achievement tests designed to assess performance in Mathematics, Science, Indonesian and English. ACER's School Life Questionnaire (SLQ) was used as an affective measure of school quality. ACER developed an instrument to assess student background characteristics, and a Principal Interview Schedule and a School Inventory were also developed by ACER to collect information on MTs. The variables assessed in the study were:



The field team was composed of 86 individuals recruited and managed by UPI and the World Bank. They received a three-day training program from ACER and UPI in the three regions, and were provided with manuals that outlined the strict guidelines regarding implementation and timing of each test. They were instructed to follow the manual closely while supervising the tests and conducting principal interviews. Data collection took place in October and November 2009 and a draft report was submitted to the client in January 2010. This was presented at a workshop on 5 February 2010, involving various stakeholders of the project. The discussions at this workshop informed the finalisation of this report, and assisted with the formulation of the recommendations.

MAIN FINDINGS

The findings on student achievement in Mathematics, Science, Indonesian and English include the following highlights:

- Mean scores showed that students in Java performed better than students in the East and West regions on each of the four achievement tests, with students in the West performing marginally better than students in the East on all tests.
- Compared to all students that sat the Trends in Mathematics and Science Study (TIMSS) and all Indonesian students that sat TIMSS, a smaller proportion of students in the QEM sample correctly answered 9 out of the 11 TIMSS Mathematics items and 10 of the 14 TIMSS Science items.
- On the English test, there was no evidence of difference between the performance of students in the QEM sample and the international comparison sample of students in the Czech Republic.
- The largest correlations between student background factors and achievement across the three regions were observed for number of home resources and study materials available to students.
- Female students achieved significantly higher than male students in Indonesian and English, while male students outperformed female students in Science. There was no significant gender difference for Mathematics.
- 1 in 10 students has repeated a grade. Students who had repeated a grade at some stage during their schooling were found to achieve lower scores than other students.
- More lessons per week in a subject were consistently related to higher achievement in that subject area.
- With respect to schools' general context as well as administrative practices, number of school resources had the strongest link with achievement (i.e., higher achievement by schools with more resources).
- In general, schools with more highly qualified teachers performed at a higher level than other schools. This link is particularly strong for the number of teachers with an undergraduate degree (S1) and in the East and West regions.

The findings on students' attitudes to school life as an affective measure of school quality include the following highlights:

- On a scale of 1 ('strongly disagree') to 4 ('strongly agree'), on average, the 35 positively-worded statements in the SLQ received an agreement rating of 3.17 from all students.
- Statements that received the strongest agreement from students were those that deal with students' views on the importance of things they learn at school and the relevance of these to their future.
- Of the positively-worded statements, those that received the lowest agreement from students were those that discuss students' views on how much their thoughts are valued by others in the school, and the respect and status they are afforded by others in the school.

Findings on the level of MTs facilities and the extent to which they meet the draft Minimum Service Standards (MSS) include the following highlights:

- Overall, MTs in Java were considerably better resourced than those in the West and East regions. This difference was particularly pronounced for multimedia equipment.
- Overall and within all regions, MTs on average had between 40 and 50 percent of the items on the list of 20 MSS facilities. Only 0.7 percent of MTs had all items, and twice as many had none of the items on the list.
- Correlates of the level of meeting the MSS are: school type (public schools have a higher percentage of MSS items), school location (urban schools have a higher percent), principal's gender in Java (schools led by women had a higher tendency to have more MSS items), and student enrolment size, and general condition of school buildings in the West and East regions.

POLICY IMPLICATIONS AND OTHER SUGGESTIONS

Based on the findings of this study, the following possible policy implications are offered:

- Teachers' qualification and certification levels were found to be significantly correlated with student achievement. With regard to certification, the process of achieving certification itself, linked to professional development workshops and preparation of professional portfolios, were also correlated with achievement (This is a particularly positive finding given the large investment the Government of Indonesia has made to certify 2.7 million teachers by 2015). Other areas of teacher practice which correlated with achievement were teachers' lesson plans and assessment plans, and principals' monitoring of teaching practices. The current study, however, showed that these characteristics and activities are not widespread among MTs.
- Manuals and training workshops for teachers need to be developed which explain the importance of teacher behaviour on student achievement.

- Teachers need to undergo professional development, where they will be supplied with accurate information about how to develop and implement good lesson plans, weekly assessment plans, and feedback and remediation strategies for students.
- Efforts should to be aimed at improving the level of resources available to smaller schools in order to increase student performance in those schools.
- Efforts should be aimed at increasing the number of school resources across less well equipped MTs in order to increase student performance in those schools.
- Given that over 65 percent of MT students expect to complete a post-secondary qualification, the madrasah education system must adequately prepare its students for the level and types of scientific analysis, problem-solving, reading comprehension and writing skills, expected of attendees of tertiary education programs.
- Efforts should focus on MTs in the East and the West region as they lag behind Java in achievement in both Mathematics and English.
- Some efforts should be directed at fostering boys' performance in English. However, only reading comprehension was assessed in the English test. Written and spoken English and listening skills were not included in the testing regime, but ideally would be assessed before any English enhancement program for boys was developed.
- Undertake additional projects to further understand the madrasah student population and how student achievement is related to various factors. Four suggestions are provided below:
  1. The study showed that MTs with teachers who have weekly assessment programs outperform MTs without such programs, particularly where these cover regular feedback and remediation for students. A useful exercise for the future would be to assess whether teachers actually implement these plans, and if they do, what impact providing feedback and remediation has on student academic performance.
  2. The overall results of the current study showed a sizeable correlation between principals' observation of teachers' lessons and subsequent advice. This is an interesting area for future work.
  3. Many Indonesian parents pay for their children to undertake additional tutorials. However, the current study revealed that such tutorials have little impact on improving student performance. Future work ought to be undertaken in the area before parents or schools make any decisions about removing their child from tutorials.
  4. Results by region showed that absenteeism is slightly lower in the East than in Java and the West. A study could be undertaken to more clearly understand the reasons behind student absences from school.

► Photo: M Wildan

1 INTRODUCTION

1. INTRODUCTION

BACKGROUND

This report covers the main phase of the 'Quality of Education in Madrasah' (QEM) study. The study aimed to provide high quality research into various dimensions of quality of education in Madrasah in Indonesia. The focus of the study was on Year 9 students in Madrasah Tsanawiyah (MTs; Islamic Junior Secondary School). Quality of education was measured through: (1) level of student achievement, comparing three regions in the country and to some extent using international benchmarks, as well as the identification of variables that are linked to achievement; (2) students' views of their schooling experience; and (3) the extent to which madrasahs meet the draft Minimum Service Standards being developed by the Ministry of National Education (MoNE), based on the Board for National Education Standards (Badan Standar Nasional Pendidikan; BSNP).

OBJECTIVES OF THE STUDY

The overarching aim of the project was to obtain a picture of the quality of education of Year 9 students in Indonesian MTs. More specifically, this included:

1. A description of the level of student achievement of Year 9 students in MTs in Mathematics, Science, Indonesian and English, overall and by region;
2. Wherever possible and appropriate, comparisons of student achievement with results from international test programs such as the Trends in Mathematics and Science Study (TIMSS), the International Benchmark Tests (IBT) and the Competence in English as a Foreign Language Assessment (CEFLA);
3. In addition to the achievement measures, a description of students' views regarding their schools as measured by the School Life Questionnaire (SLQ);
4. Description of school facilities within the draft Minimum Service Standards (MSS) framework;
5. Description of the background of students attending MTs such as language spoken at home, parental education, home resources, absence from school, grade repetition, instructional materials and homework practices;
6. Identification of any student background variables that are related to student achievement;

7. Identification of any school facilities that are related to student achievement; and
8. Identification of any relationship between responses on the SLQ, student achievement and school facilities.

An additional outcome was to provide information on the psychometric properties of the instruments used in the study.

EDUCATIONAL CONTEXT

The word madrasah comes from the Arabic word for 'school', but in Indonesia the term refers specifically to formal education institutions that make up the Islamic education system governed by MoRA, running parallel with the general education system. Under Indonesian national Law No. 20/2003, madrasahs are an integral part of the National Education System, and indistinguishable from schools forming the general education system under the MoNE.

What differentiates madrasahs with general education institutions, however, is their history. While the current general education institutions took their model from the schools established during the Dutch colonial times, madrasahs were established as an attempt to provide education to the Indonesian masses, a response to the widely held view that Dutch schools were accessible mainly by the ruling elite and government officials. Because of this history, the madrasah education system is commonly seen as a more indigenous form of education and in many communities in Indonesia to this day local madrasahs are the main path to literacy for poor children, especially for girls (MoRA, 2003; USAID, 2006).

The madrasah education system was brought to Indonesia in the late nineteenth century by scholars returning from study in the Middle East. Although the model was adopted from Islamic education institutions in the Middle East that dates back to the Middle Ages, the Indonesian adaptation is considered unique among similar institutions in other countries because from its inception, it also taught a general school curriculum that was then used in the Dutch schools, together with religious education. There were no legal requirements for madrasahs to do so, however, until well after independence, with a joint decree in 1976 that required 30 percent of teaching in madrasahs to follow MoNE curriculum. A decade later this ratio was reversed, with Law 8/1989 mandating a formal relationship between MoRA and MoNE and calling upon madrasahs to allocate 70 percent of their teaching to the curriculum followed by general schools (MoRA, 2003). This proportion is retained under current legislation.

Similar to the general education system, there are three levels of madrasah education: Madrasah Ibtidaiyah (MI / primary school), Madrasah Tsanawiyah (MTs / junior secondary school) and Madrasah Aliyah (MA / senior secondary school). As indicated in the introduction to this report, this study focused on MTs. MTs take up the largest share of the national education system among the three madrasah levels – with over 20 percent of Indonesian students at that level enrolled in a madrasah (see Table 1.1). In the 2007/08 academic year, madrasah institutions constituted over 17 percent of all formal educational institutions in the primary and secondary levels in Indonesia. Close to 13 percent of Indonesian primary and secondary students were enrolled in one of these institutions.

As with the general education system, madrasahs may be public or private. A great majority, however, are private (see Table 1.2) and most are run by foundations linked to mass Islamic organisations. Under this governance system, many private madrasahs are also required to incorporate teachings of the relevant Islamic foundation.

Figure 1.1 Proportion of Indonesian Students in Education System: Junior Secondary Level

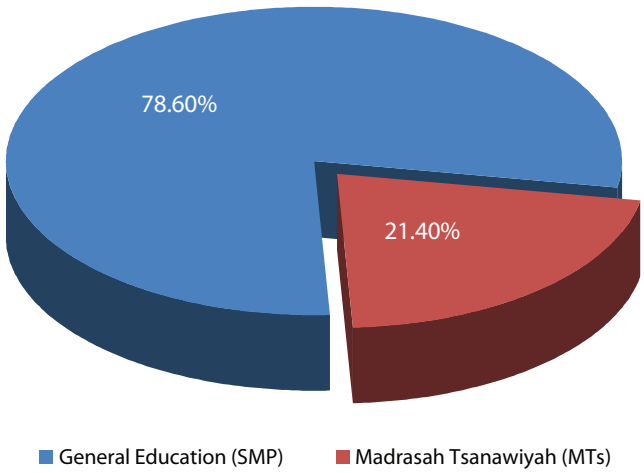


Table 1.1 Proportion of Indonesian Students Enrolled in Madrasahs

Level of Schooling	Schools / Institution	Enrolled Pupils	%
Primary	165,755	29,489,266	
General Education (SD)	144,567	26,627,427	90.3%
Madrasah Ibtidaiyah (MI)	21,188	2,870,839	9.7%
Junior Secondary	39,160	10,961,492	
General Education (SMP)	26,277	8,614,306	78.6%
Madrasah Tsanawiyah (MTs)	12,883	2,347,186	21.4%
Senior Secondary	22,383	7,353,408	
General Education (SMA)	10,239	3,758,893	51.1%
Madrasah Aliyah (MA)	5,398	855,553	11.6%
Vocational (SMK)	6,746	2,738,962	37.2%

Source: "Ikhtisar Data Pendidikan Nasional Tahun 2007/2008", Kemdiknas (2008)

Table 1.2 Proportion of Private and Public Madrasahs

Type of Institution	Institutions	%	Enrolled Students	%
Madrasah Ibtidaiyah	21,188		2,870,839	
Public	1,567	7%	342,579	12%
Private	19,621	93%	2,528,260	88%
Madrasah Tsanawiyah	12,883		2,347,186	
Public	1,259	10%	558,100	24%
Private	11,624	90%	1,789,086	76%
Madrasah Aliyah	5,398		855,553	
Public	644	12%	307,229	36%
Private	4,754	88%	548,324	64%

Source: "Annual Education Statistics 2007/2008", Kemenag (2008)

Measuring Education Quality in Indonesian Madrasah

The issue of measuring education quality is an important one internationally. Improving the quality of education is one of the current Education For All goals, in which it is defined as the achievement of 'learning outcomes that are recognised and can be measured, particularly with regards to literacy, numeracy and other skills essential to life', while also making reference to international assessment programs. In Indonesia, its importance is also acknowledged, particularly since the establishment of the Board of National Education Standards (Badan Standar Nasional Pendidikan / BSNP) in 2005.

The 2007 EFA Mid-Decade Assessment Report for Indonesia made reference to the creation of BSNP and the educational standards they have developed as a landmark starting point to education quality control in Indonesia. In the four years since its inception, BSNP has developed national standards for graduating competencies, curriculum content, teaching, facilities, management, financing and assessment, as well as regularly evaluating the appropriateness of textbooks used in schools and providing oversight to the national examinations.

The national examinations are administered by MoNE to students in the last year of junior secondary and senior secondary schools, both in the general and madrasah education systems. Some of the national assessments have existed since colonial times, though their format has faced a number of changes. Until 2002, graduation from secondary school was decided by the EBTANAS system (National Evaluation of Final Learning Stage / Evaluasi Belajar Tahap Akhir Nasional), which combines the national examination results with results of tests conducted within each school. This changed into the current UN (National Examinations/Ujian Nasional) system, where a student's combination and individual results on the national examinations determined their graduation from that level of education. The subjects currently tested as part of national examinations at the junior secondary level are Mathematics, Science, Indonesian and English.

► Photo: M. Wildan

► Photo: M Wildan

To illustrate the progress of education quality in Indonesia, the 2007 EFA report used examples from national examinations data, showing that the average scores and pass rates have increased between 2000 and 2006. It noted also that the gap between scores for students in the MoNE and MoRA systems has decreased over the same time period. A separate study that compared the performance of general junior secondary (SMP) and MTs students in the 2007/08 national examinations found that overall, MTs students performed better than SMP students in all subjects except Indonesian, and they had higher pass rates as well (Sjafrudin, 2008).

A 2005 World Bank study looked at the effect of school type on junior secondary student achievement in Indonesia (Newhouse & Beegle, 2005). The study used data from three full rounds of the Indonesia Family Life Survey. Respondents between the ages of 14 and 25 years were asked to provide their score on the national examinations and household information such as the type of school they attended at each level. This allowed the researchers to control for a number of student background variables. For the most part, students in public schools were grouped together in the study as public madrasah and public secular students were shown to have similar levels of achievement. The study did, however, draw distinctions between different types of private schools. It found that students at private madrasahs performed at a similar level to students at private secular schools, and that both groups were significantly outperformed by public school students and students at private Christian and Catholic schools.

Data from the national examinations, however, are often questioned on the basis of reliability and validity (Matters, 2008). Every recent cycle of the examinations has been followed by reports of widespread cheating and administration errors. It is therefore important to note that the literature review conducted for this report did not find any empirical studies that have looked at measuring the quality of madrasah education with the use of independent measures outside of national examinations data. Similarly, there were no such studies using international benchmarks.

Photo: Peter Riddell-Carre

A number of national level achievement studies were conducted in Indonesia in the late 1970s and early 1980s, with the aim of collecting information on the relationship between home and school background variables and student achievement (Jiyono & Suryadi, 1982; Mangindaan, Sembiring, & Livingstone, 1979; Moegiadi, Mangindaan & Ellery, 1978). However, based on available reports, it appears that only schools under the general education system were included in these studies. To develop an indicator of student achievement, these studies developed tailored achievement tests using items from the national examinations item bank.

Two studies, first undertaken in 1978 with a repeat study in 1982, focused on Year 9 Indonesian students. The first study used five standardised achievement tests with over 9,000 Year 9 SMP students across 10 districts in Indonesia (Mangindaan, Sembiring & Livingstone, 1979). Questionnaires to collect background information were also administered to students, teachers and principals. The study reported a number of interesting findings: regression analyses showed large regional variations in achievement; grade repetition was more frequent in rural areas; in urban areas, students taught by teachers who had undergone special in-service training courses were found to perform better in mathematics and science than those whose teachers have not undergone such training. The study also found that school efficiency, measured by the frequency of staff meetings, was correlated with student achievement in both urban and rural areas.

A replication of the study was conducted in 1982 to examine changes made by developments in the curriculum, increase in enrolment rates and improvement in facilities. This study found that boys in urban areas performed at about half a standard deviation higher than rural boys, and for girls the difference was about one-third of a standard deviation. There was no observed difference between boys' and girls' achievement levels. The study confirmed earlier findings that grade repetition occurred more frequently in rural areas, but also that students who had repeated a grade received lower scores than those who had not.

The 1982 study found that the mathematics achievement score of urban children in public schools were about half a standard deviation higher than urban children in private schools.

However, in rural areas there was no difference in scores between children in private and public schools. Years of teaching experiences and student achievement was strongly correlated for teachers with three or less years of teaching experience (after the third year there was a plateau on achievement scores). There was also a reported difference in student achievement between schools with libraries and those without, with the former outperforming the latter.

There is no record of similar studies being conducted after the mid 1980s. It is important to note again that these older studies excluded madrasah, so the extent to which the findings may be applied to the madrasah context is unknown.

Further, although Indonesia participates in a number of major international studies including the Programme for International Assessment (PISA; Organisation for Economic Co-operation and Development [OECD]), Trends in Mathematics and Science Study (TIMSS; International Association for the Evaluation of Educational Achievement [IEA]) and Programme for International Reading and Literacy Study (PIRLS; IEA), Indonesia does not explicitly stratify the sample to include madrasah schools in these studies.

MoRA (2003) noted that the comparative advantage madrasah education offers is its "emphasis on attitudes, values and behaviour, as well as knowledge" by integrating general and religious education (p. 73). However, despite reports that there has been a MoNE initiative to include qualitative measures on norms and values to influence decisions on educational advancement and graduation, the instruments were never widely tested and implemented (MoRA). Ultimately, although MoRA attempted to redefine measurement of education quality, and suggested several variables that need to be included, in discussing education quality in madrasah, it solely used the available indicators and compared national education results with madrasah and general education students.

Studies On Madrasah Education In Other Countries

A cursory glance at the literature found that a number of studies have been conducted with the Islamic school sector in several countries, but few focused on student achievement. A study on school choice among Muslim families in Pakistan, for example, argued that parents place a much stronger importance on the value of religious education than expected by international agencies. It found that when parents were asked about their educational priorities for their children, religious education tended to be placed at the top of the list before any other factors, including vocational value (Andrabi, Das, Khwaja, & Zajonc, 2005).

A 2006 study on religious and secular secondary school quality in Bangladesh is relevant to the current study as in Indonesia madrasahs in Bangladesh are recognised by their government and offer a mixture of Islamic and general 'modern' curriculum (Asadullah, Chaudhury & Dar, 2006). The study used data from a mathematics test constructed from TIMSS 1999 released items, student and teacher surveys, and interviews with head teachers. Asadullah and colleagues found that female students performed worse than male students, and that a higher proportion of female teachers at a school was correlated with higher test scores. The paper cited other studies which suggested that this might affect female students more strongly. Looking at the educational history of students, the study also concluded that students who attended a primary-

level madrasah had lower test scores than those who did not. Overall, however, the study found no difference between the achievement levels of secular and religious school students.

In studies that compared the academic achievement of students in religious and secular schools, the point is often made that families take a variety of social and religious aspects into consideration when choosing to send their children to religious schools, therefore putting a caveat on comparisons with secular schools. As more countries and states with significant proportions of Islamic schools begin to take part in international studies such as TIMSS and PISA (Morocco, Oman and Palestine participated in TIMSS 2007, for example, and Jordan, UAE and Turkey participated in PISA 2009), the potential for interesting analyses on the performance of different Islamic education models will continue to grow.

CURRENT REPORT

This report is written for the MoRA and CSAS. The main purpose of the report is to present the findings of the study and to offer policy recommendations stemming from the findings. Following an overview of the educational context in which the study took place, a section on methodology covers the sampling approach, instrument selection and adaptation as well as notes from the data collection process and the methods of analyses employed.

The results section begins with descriptions on the level of student achievement in the academic tests incorporating, when relevant, comparisons with results from international benchmarks. Following this are descriptions of outcomes of non-academic measures: students' perceptions on the madrasah they attend; madrasah facilities; and student background information. Results from correlation analyses of student background, school facilities and attitude measures with achievement outcomes are used to identify variables that are linked to student achievement. The report concludes with suggestions and possible policy implications.

► Photo: M Wildan

2 METHODOLOGY

2. METHODOLOGY

This section details the methodologies used in the main study of the QEM project. Details about sampling are provided, including the selection of regions, schools and respondents. Each of the instruments used in the study is then described, followed by the procedures undertaken to select and train the field team and to collect data from the target schools. The section concludes with details about the issues which arose during the main study. Details on the methods used during the pilot testing phases of this project are provided elsewhere (see Kos, Nugroho, & Lietz, July 2009; Lietz & Nugroho, August 2009).

SELECTION OF SAMPLE

In March 2009, CSAS, ACER and UPI agreed that MTs would be the target sample for the QEM project. It was also agreed that students in class three (i.e., Year 9) would form the sample for the study and that the principal or deputy principal from each participating school would be interviewed. MTs were selected as they are the mid-level of Madrasah education, bridging the primary level – Madrasah Ibtidaiyah (MI) and the senior secondary level – Madrasah Aliyah (MA). Year 9 students were selected as this level is the final year of compulsory education in Indonesia.

A list of all madrasahs in which students had participated in the Indonesian National Exam for Year 9 during 2008 was obtained in a spreadsheet. For each school, this list contained information regarding the number of students who had sat the national examination, the number of students who passed, the average school performance score and whether a school was public ("Negeri") or private ("Swasta"). Of the total number of madrasahs (N = 12,396), about 10 Percent (N = 1,256) were public schools.

Table 2.1 Provinces Assigned to Regions

Province ID	MoRA ID	Province name	Region
01	11	Nanggroe Aceh Darussalam	West
02	12	North Sumatera	West
03	13	West Sumatera	West
04	14	Riau	West
05	15	Jambi	West
06	16	South Sumatera	West
07	17	Bengkulu	West
08	18	Lampung	West
09	19	Kepulauan Bangka Belitung	West
10	20	Kepulauan Riau	West
11	31	DKI Jakarta	Java
12	32	West Java	Java
13	33	Centrral Java	Java
14	34	DI Yogyakarta	Java
15	35	East Java	Java
16	36	Banten	Java
17	51	Bali	East
18	52	West Nusa Tenggara	East
19	53	East Nusa Tenggara	East
20	61	West Kalimantan	West
21	62	Central Kalimantan	West
22	63	South Kalimantan	East
23	64	East Kalimantan	East
24	71	North Sulawesi	East
25	72	Central Sulawesi	East
26	73	South Sulawesi	East
27	74	Sulawesi Tenggara	East
28	75	Gorontalo	East
29	76	West Sulawesi	East
30	81	Maluku	East
31	82	North Maluku	East
32	91	West Irian Jaya	East
33	92	Papua	East

For subsequent sampling, schools were then categorised in to one of five groups based on their average school performance on the national examination. These five groups contained similar numbers of schools:

1. Highest achievement: > 30.20 (19.3%)
2. Second highest achievement: 28.31-30.20 (20.4%)
3. Middle achievement: 26.61-28.30 (19.6%)
4. Second lowest achievement: 24.31-26.60 (20.5%)
5. Lowest achievement: ≤ 24.3 (20.2%)

The overall list was then divided into three parts, East Indonesia, Java, and West Indonesia. Each of the provinces was assigned to one of the three regions as detailed in Table 2.1. The number of schools that formed the final sampling frame in each region is given in Table 2.2. Each of the 33 provinces was included in the target population in order to obtain population estimates of performance for all madrasahs across Indonesia as well as the three regions. This was in line with the main aim of the study, that is, to obtain an overall picture of madrasahs across Indonesia. To the authors' knowledge, this is the first study which has included all provinces in the sampling frame.

Table 2.2 Number of Schools Forming Sampling Frame Overall and Within Each Region

		West	Java	East	Total
(a)	Number of schools in sampling frame	3,601	6,501	2,294	12,396
(b)	Number of schools originally sampled	50	50	50	150
(c)	Number of originally participating schools	42	45	46	133
(d)	Number of replacement schools	8*	5	4	17
(e)	Total selected schools (incl. replacements)	58	55	54	167
(f)	Number of schools in final sample	50	50	50	150
(g)	Number of private schools, final sample	44	45	43	132
(h)	Number of public schools, final sample	6	5	7	18
(i)	School response rate (c)÷ (b)	84%	90%	92%	89%
(j)	Study response rate (f) ÷ (e)	86%	91%	93%	90%

**This included four replacement schools for those located in West Sumatera in the original sample, as that province was excluded from the study because of the earthquake that occurred on 30 September and 1 October, 2009.*

Within each region, the schools were sorted according to the following characteristics in order to increase sampling accuracy:

1. Province (in ascending order of province ID);
2. Public/private (public followed by private);
3. Achievement group (from highest to lowest);
4. Number of students who sat the 2008 exam as an indication of school size (from larger to smaller)

As the next step, a sampling interval was calculated by dividing the total number of schools in the sampling frame for each region by the number of schools to be sampled (i.e., 50 in each region). This meant that the sampling interval in the West was 72, in Java 130 and in the East 46. Then, for each region, a random starting point was selected using the website http://www.random.org/. Finally, schools were selected by choosing every 72nd school in the West, every 130th school in Java and every 46th school in the East.

This sampling design meant that all schools had an equal probability of being selected, regardless if its enrolment size. As a consequence, students in smaller schools had a higher probability of entering the sample than students in larger schools. In order to adjust for the fact that schools reflected different proportions of the population, a school sampling weight was calculated and used in the analyses.

In some instances, the schools selected to participate in the study could not be contacted because of incorrect school names or contact details. These schools were replaced by schools that were as similar in terms of location, size, school type and achievement as possible to the originally selected schools. None of the schools invited to take part in the study refused to participate. However, three voiced concerns about the involvement of foreign countries (i.e., Australia). UPI was able to allay these concerns, with all three madrasah participating in the study.

In schools with two Year 9 classes or fewer, all Year 9 students were included in the sample. In schools with more than two Year 9 classes, the "a" class was sampled as well as the class group with the letter that was furthest from "a". This meant that, for example, in a school with five Year 9 classes, classes 9a and 9e were sampled. As ability grouping tends to occur in madrasahs, like in non-religious schools in Indonesia, this meant that there was a tendency that students in the highest achieving class (i.e. 9a) and the lowest achieving class (e.g. 9e) were tested.

While this procedure of selecting classes within schools is less than desirable from the view of probability sampling, it was followed for logistical reasons. First, for most schools, it was impossible to obtain information regarding the exact number of Year 9 classes and students prior to data collection team leaving for the field. Second, the implementation of some form of externally designed probability sampling within-schools would have meant an unacceptable delay to the tightly scheduled field-work which had to be completed within six weeks. Finally, while the design might result in a slightly greater error of the overall mean achievement estimates, it might lead to a more confident approximation of the overall spread of achievement across students in Indonesian madrasahs.

Table 2.3 Actual and Effective Sample Sizes, Design Effects and Intra-Class Correlations

	Overall	East	Java	West
Actual sample size (number of students)	6,233	1,840	2,335	2,058
Intraclass correlation (ICC)	0.14	0.17	0.11	0.15
Cluster size (average class size)	28	26	32	27
Design Effect	4.78	5.25	4.41	4.9
Effective sample size	1,304	350	529	420

ICC= $\frac{\sigma_\alpha^2}{\sigma_\alpha^2 + \sigma_\varepsilon^2}$ (computed using home resources in the SPSS procedure "reliability" and requesting the ICC statistics).
deff = 1 + (rho) (b-1); where rho = intraclass correlation, b = cluster size.
Simple equivalent sample = size of complex sample / deff

Given the cluster sampling design of the current study, it is important to recognise that the simple equivalent sample size - sometimes called "effective sample size" - is considerably smaller than the number of students from whom information was actually collected during the field work. This is a result of the fact that schools were the primary sampling unit (PSU) and that students were subsequently sampled within schools. Thus, all the students in the sample cannot be considered to be independent from each other as students within one school are more like each other than students in different schools. The design effect is intended to adjust for this fact and in order to arrive at an estimate of the size of the sample if the sample had been a simple random sample of students. Table 2.3 provides information regarding the actual and effective sample sizes for the study overall as well as for the regions.

INSTRUMENTS

A number of instruments were tested in pilot studies conducted during June and August 2009. These pilots led to amendments being made to the instruments, and in the case of the language tests (Indonesian and English), trialling of new instruments. The adapted versions of those tests were used in the current phase of the project (Main Study)(See Kos, Nugroho and Lietz (July, 2009) and Lietz and Nugroho (August, 2009) for more details on the analyses of the instruments used in the QEM pilot phases). The items included in the final versions of the four academic achievement tests (see Appendix A) were those that allowed for the full range of students' ability during the two pilot phases of the project. Some items were required from lower year levels (i.e., Years 4 and 6) for the mathematics and science tests (see below for more detail).

In total, eight instruments were used in the Main Study: four were designed to assess academic achievement in one of four curriculum areas: Mathematics, Science, Indonesian and English. The mathematics and science tests were translated into Indonesian and were then verified to ensure accurate translation. The Indonesian test was written in Indonesian and therefore did not need to be translated into Indonesian. A scene-setting sentence was translated for each set of items on the English test, while the stimulus and answer options remained in English. The remaining instruments were used to assess quality of school life, demographic characteristics of students, demographic characteristics of school leaders, and level of school facilities. These instruments were all translated into Indonesian and verified for use in the study. The eight instruments are detailed below.

Academic Achievement Tests

Mathematics test. ACER developed a 30 item test to assess Mathematics achievement. Items were derived from the Trends in Mathematics and Science Study (TIMSS) and the International Benchmark Tests (IBT) Mathematics Years 4, 6 and 8. Of the 30 Mathematics items:

- 11 were derived from IBT Year 4
- 4 were derived from IBT Year 6
- 4 were derived from IBT Year 8
- 11 were derived from TIMMS 2007 Year 8 test

Questions on these tests are based on problem solving, reasoning and thinking skills which underpin the subject specific content domains. The skills assessed include inferring, interpreting data, predicting and drawing conclusions. That is, those items that differentiated between well and poorer performing students were selected. In addition, item difficulty was taken into account when putting together the final test – items were included that were relatively easy, relatively difficult and of average difficulty level, as shown in the pilot phases. An attempt was also made to include items from each of the test domains (e.g., number, measurement, geometry, algebra, chance and data).

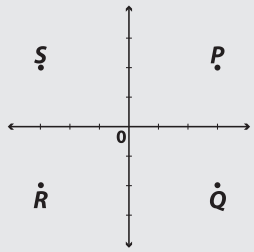
Examples of items from the Mathematics test are shown below. Each of these items is a TIMMS 2007 released item.

NUMBER

Which of the following numbers is the **smallest**?

A. 1/2
B. 5/8
C. 5/6
D. 5/12

GEOMETRY AND MEASUREMENT



Which of the following represents the point (3, -2) on the graph?

A. P
B. Q
C. R
D. S

ALGEBRA

A bus travels at a constant speed so that the distance travelled is directly proportional to the time spent travelling. If the bus travels 120 km in 5 hours, how many kilometers does it travel in 8 hours?

A. 168
B. 192
C. 200
D. 245

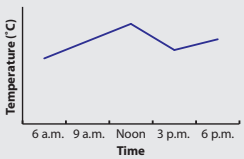
CHANGE AND DATA

The table shows the temperatures at various times on a certain day.

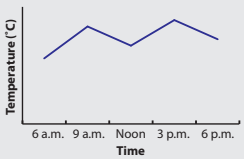
Time	6 a.m.	9 a.m.	Noon	3 p.m.	6 p.m.
Temperature ^{o}C	12	17	14	18	15

A graph, without a temperature scale, is drawn. Of the following, which could be the graph that shows the information given in the table?

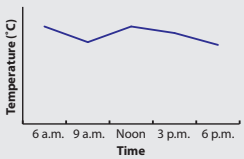
A.



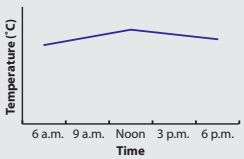
B.



C.



D.



Science test. A 30 item test was developed by ACER, with items derived from TIMSS and IBT Science Years 4, 6 and 8.

Of the 30 Science items:

- 6 were derived from IBT Year 4
- 11 were derived from IBT Year 6
- 7 were derived from IBT Year 8
- 6 were derived from TIMSS 2007 Year 8 test

The IBT Science test contains items assessing student knowledge in the areas of earth science (atmosphere, structure of earth and universe), physical science (properties of matter, energy, motion) and life science (cells and organisms, environment of organisms, biological evolution). As with the Mathematics test, item difficulty was taken into account, and effort was made to include items from each of the Science domains (e.g., earth, physical and life).

An example of an item from each of the Science domains covered in the test is shown below. Each of these items is a TIMSS 2007 released item.

EARTH SCIENCE

Which resource is nonrenewable?

A. petroleum
B. sand
C. wood
D. oxygen

LIFE SCIENCE

The heart, veins, arteries, and capillaries make up which organ system?

A. reproductive
B. muscular
C. excretory
D. circulatory

PHYSICAL SCIENCE

A sound is heard when you pluck a string on a guitar. What will happen to the sound if the same string is plucked harder?

A. The volume will stay the same, and the pitch will be higher.
B. The pitch will stay the same, and the volume will be higher.
C. Both the pitch and the volume will be higher.
D. Both the pitch and the volume will stay the same.

Indonesian test. The Indonesian language test was developed by academic staff in the Postgraduate Indonesian Languages Section of UPI. The items were derived from the 2008 National Examination and its modification. Two 40 item tests were trialled during the pilot phases and the items which allowed for a spread of student ability, while differentiating between well and poorer performing students, were included in the final version of the test. The test was designed to assess students' understanding of the Indonesian language and literature by testing comprehension of a variety of texts, including news passages, narrative texts, letters and literature (e.g., poems, plays).

The Indonesian language test contained items assessing student knowledge in the areas of writing (assessing spelling and vocabulary), reading (assessing grammar and reference) and speaking. As with the Mathematics and Science tests, item difficulty was taken into account, and effort was made to include items from each of the Indonesian language domains.

An example of an item from each of the Indonesian domains covered in the test is shown below.

WRITING

Kata-kata bergaris bawah yang penulisannya tidak baku dijumpai pada kalimat...

A. Dengan menyilangkan berbagai varietas tumbuhan diperlukan waktu lima belas tahun untuk menghasilkan varietas baru.
B. Untuk membantu siswa dalam memilih masa depannya di sekolah diberikan bimbingan karier.
C. Akibat hujan terus-menerus jadwal pertandingan menjadi kacau.
D. Kita harus konsekwen terhadap semua yang sudah kita sepakati.

SPEAKING

Pantun jawaban yang tepat terhadap pantun tersebut adalah ...

A. Mau ke mana gunung dikejar
   Sudah tinggi banyak berduri
   Terima kasih nasihat belajar
   Tentu akan kutaati
B. Beli tikar berpuluh-puluh
   Dipakai duduk berdua-dua
   Pastilah tercapai cita-cita
   Bila belajar bersungguh-sungguh
C. Kerja keras mencari uang
   Uang didapat beribu-ribu
   Dari mana aku datang
   Tidak perlu kamu tahu
D. Sukar sungguh menjala teri
   Dikejar menghilang terus berlari
   Belajar haruslah setiap hari
   Untuk bekalmu nanti

READING

Kenaikan BBM yang begitu tinggi mengagetkan masyarakat bawah. Sejumlah pengamat menilai kenaikan itu sangat tidak rasional dan terburu-buru. Menurut mereka, alasan pemerintah soal kebijakan itu merupakan pembohongan publik.

Gagasan utama paragraf tersebut adalah ....

A. sorotan harga BBM sangat sering
B. penilaian harga BBM tidak rasional
C. kenaikan harga BBM mengagetkan
D. pengumuman BBM disampaikan masyarakat

English test. The IBT English Years 4, 6 and 8 were piloted in June 2009, and the results showed that all three levels were too difficult for the Year 8 Madrasah students. Internal consistencies were extremely low (Year 4 = 0.2; Year 6 = 0.04; Year 8 = -0.02) and responses appeared to be random, suggesting that students guessed answers. Discussions with field team members and students following the tests revealed that this was probably correct. As a result, these tests were replaced by another ACER instrument for the second pilot study – the Competency in English as a Foreign Language Assessment (CEFLA).

CEFLA is a new testing program developed by ACER, linked to the Common European Framework of Reference for Languages (CEFR). It is designed to assess the English language ability of those for whom English is a foreign (rather than second) language. The test consists of six levels in ascending order of difficulty assessing reading and listening comprehension skills. The

development of speaking and writing components is currently underway. The CEFLA was sat by over 2,300 secondary school students in the Czech Republic in April 2009, where it was shown to have good psychometric properties.

Two levels that make up the Basic User level of the CEFR were used in the second pilot study: A1 (Breakthrough) and A2 (Waystage). As difficulty level and appropriateness were major concerns during the first pilot study, two versions of CEFLA were trialled in the second pilot. There were 16 items in Reading Form A and a different set of 16 items in Reading Form B, which were translated into Indonesian. In both versions, the stimulus was written in English to test students' comprehension of the stimulus only without having to also decipher the questions. Four common items were kept in English to link the two tests. This design facilitated the comparison of difficulty levels of the items in the two versions. The 15 grammar items were tested in English.

The second pilot study showed no difference between the test versions. It also showed that while the Reading items differentiated well and poorer performing students, the Grammar component did not. This is an important finding given the strong emphasis the Government of Indonesia has placed on language reading ability in the national curriculum.

The Grammar component was therefore removed from the test. The final version of the English test included only the Reading items from CEFLA which were written in English. The test included the 30 CEFLA items which best discriminated between lower and higher performing students in the second pilot study. The research team has some reservations about student's knowledge of some of the topics in the test (e.g., toaster, postcards), so as an added precaution, ACER wrote scene setting information for each group of questions in the English test and translated them into Indonesian.

► Photo: M Wildan

School Life Questionnaire. The School Life Questionnaire (SLQ), developed by ACER, was used to measure students' perceptions and feelings toward different aspects of school life. The SLQ provides data on students' ratings of their school connectedness, engagement and motivation to learn – thus providing a measure of school quality outside typical measures of quality which assess academic achievement only. This instrument was therefore used to provide more qualitative information on quality of schooling.

The SLQ measures attitudes towards school in general, towards learning, towards teachers and towards other students. Information on these kinds of 'affective' variables complements more traditional measures of outcomes. It consists of 40 items or statements that are prefaced by 'My school is a place where…'. The response key for each item is a four-point Likert scale anchored at 1 'strongly agree' and 4 'strongly disagree'. The instrument includes 35 positively-framed items and five negatively-framed items. It also taps five specific domains – teachers, relevance of schooling for their future, sense of achievement, perception on the status accorded to them compared to others in the school, and social integration in school.

The scale has been used widely in various contexts around the world, and has been shown to have good construct validity. It has been used in numerous research studies and evaluations with secondary school students, including:

- Cross-sectional study of 8,500 students in Years 7-12 in 50 Victorian government secondary schools (Ainley, Reed & Miller, 1986);
- Longitudinal study of 3,000 Year 9 students in 1987 to Year 12 in 1990 from New South Wales government secondary schools (Ainley & Sheret, 1992);
- Study of 8,265 Year 12 students in New South Wales secondary schools (Mok & Flynn, 2002);
- Large-scale survey of 19,477 students in Hong Kong (Kong, 2008);
- The Longitudinal Surveys of Australian Youth (Marks, 1998);
- Studies in Northern Ireland (Wright & Scullion, 2007) and in New Zealand (Boyd, McDowall & Cooper, 2002).

In the current project, the SLQ was translated into Indonesian and verified. It was trialled in both pilot phases, where reliability tests and translation verifications were conducted. Only minor adjustments were made to translations for the Main Study.

Student Background Questionnaire. The student questionnaire was developed by ACER to obtain information on the background of students enrolled in MTs. It was based on instruments used in the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) project (UNESCO-IIEP, 2004) and the Reading and Mathematics Assessment Study in Vietnam (World Bank, 2004a, 2004b).

Data on student-level factors, such as gender, parental education, educational resources in the home, socio-economic status, attitudes to school and homework practices were collected. This information was sought for four main purposes. First, it was collected to provide a profile of students in Year 9 at MTs. Second, to enable reporting of achievement data by subgroups (e.g., by gender). Third, information was sought on variables (e.g., number of books; language spoken

at home) that have repeatedly been shown to explain a large amount of the difference between high and low achieving students across various curriculum areas (e.g., Comber & Keeves, 1973; Organisation for Economic Co-operation and Development [OECD], 2007; Wagemaker et al., 1996). Fourth, the information was collected in order to create indicators (e.g., parental education based on mother's and father's education). Both the third and fourth purposes were aimed at providing variables and constructs for use in analyses to explain differences in achievement between students and between schools.

Changes were made to the instrument following the pilot studies – amendments were made to the wording of some questions, the order of other questions, and the grouping and layout of response options. The version of the student questionnaire used in the Main Study consisted of 23 questions and took about 45 minutes to complete.

The topics covered in the student background questionnaire were:

- Student demographics (e.g., gender, age, language spoken at home);
- Educational resource at home (e.g., number of books, availability of newspapers and magazines);
- Socio-economic status of the home (e.g., building materials used for home, availability of electricity);
- Home context (e.g., number of meals eaten per day, time spent working for family);
- School attendance (e.g., number and reasons for school absence, grade repetition);
- School resources (e.g., library, study materials, exercise books, instructional time);
- Homework (e.g., frequency, assistance and checking);
- Outside school tuition (e.g., hours per week spent in extra tutorials across different curriculum areas);
- Educational aspirations (e.g., expected level of education).

Principal Interview. An interview schedule was developed by ACER to collect background information on Principals of the MTs visited, as well as information on the MTs themselves including; location, teacher characteristics, student enrolment, school management operations, teaching and assessment practices, and school facilities. The interview took approximately two hours to complete.

School Inventory. The school inventory is a short instrument developed by ACER to assess the extent to which MTs meet the draft Minimum Service Standards being developed by MoNE, based on the Board for National Education Standards (Badan Standar Nasional Pendidikan / BSNP). These include standards related to content, process, teaching staff, facilities and infrastructure, management, and evaluation.

PROCEDURE

A field team of approximately 90 members was assembled by UPI (for Java) and the World Bank (for the East and West). UPI recruited current graduate students through a process which took into their classroom and research field work experience. The World Bank hired people at the district level in each area sampled from a database of enumerators who have participated in previous World Bank survey projects.

ACER drew the sample of MTs and sent UPI the list. UPI, with the assistance of East and West Field Supervisors then telephoned each MTs regarding an explanation of the project and to request their participation in the study. All MTs contacted agreed to take part. An accompanying letter from MoRA for each participating school was given to field team members prior to visits to clarify and explain in writing the purposes of the study.

The field team of 86 individuals from around Indonesia was trained in three separate sessions, each over the duration of 3 days. The Java team of 29 attended a training session in Bandung from 30 September to 2 October, the East team of 28 attended a training session in Makassar from 7 to 9 October, followed by the West team of 29 who attended a training session in Jakarta from 12 to 14 October. A representative from ACER and from UPI delivered all training programs, which covered an introduction to the study and the instruments used, a detailed explanation of the role and responsibilities of field team members, as well simulations of test administration and interview techniques. Strict guidelines regarding implementation and timing of each test was documented for field team members during their training. Each field team member was provided with a copy of the manual and instructed to follow the manual closely while supervising the tests.

School visits were conducted in Java from 12 October to 11 November 2009, in the East from 13 October to 20 November 2009 and in the West, from 19 October to 26 November 2009. Table 2.4 provides details of the number of provinces, districts, and schools included in the main study. The higher number of private madrasah in the sample reflects the higher proportion of private madrasah in Indonesia.

Table 2.4 Number of Provinces, Districts, and Schools Involved in the Main Study

	Java	East	West
Provinces	6 DKI Jakarta, West Java, Central Java, East Java, DI Yogyakarta, Banten	13 South Sulawesi, West Sulawesi, Central Sulawesi, North Sulawesi, South East Sulawesi, Gorontalo, Maluku, South Kalimantan, East Kalimantan, Bali, West Nusa Tenggara, East Nusa Tenggara	10 Nanggroe Aceh Darussalam, Riau, Kepulauan Riau Jambi, North Sumatera, Lampung, South Sumatera, Bengkulu, West Kalimantan, Central Kalimantan
Number of Districts	46	42	45
Number of Schools	50 (5 public; 45 private)	50 (7 public; 43 private)	50 (6 public; 44 private)
Replacement schools	5 schools were replaced as they could not be contacted and 1 school in Jakarta no longer existed	No replacement	6 schools were replaced in West Sumatera as they had been affected by an earthquake

On Day 1, students took part in the first phase of testing, which included the Student Background Questionnaire, the Indonesian language test and the Mathematics test. The field team member read out aloud each question from the Student Background Questionnaire, and allowed students to ask for clarification on any item. In addition, the field team member walked around the classroom while students completed the instrument as an added measure toward ensuring that questionnaires were filled in as completely as possible (i.e., to keep the amount of missing data to a minimum). Students were given up to 45 minutes to complete their questionnaire. The Indonesian test was then administered, followed by the Mathematics test. Students were given exactly 60 minutes to complete the Indonesian test and 45 minutes to complete the Mathematics test.

The school principal was to be interviewed and the School Inventory completed on Day 1 as well. Following the principal interview, the field team member asked to be taken on a tour of the Madrasah in order to complete the inventory. This allowed the data collector to also sight a number of teacher documents from a randomly selected teacher. As data collectors completed the inventory through direct observation, the inventory was also used as a tool to verify a number of responses given during the principal interview.

On Day 2, students took part in the second phase of testing, which included the SLQ, and the Science and English tests. Students were given 40 minutes to complete the SLQ, exactly 45 minutes to complete the Science test, and exactly 60 minutes to complete the English test. Table 2.5 provides a summary of the tasks undertaken on Day 1 and 2 at each of the participating Madrasah.

Table 2.5 Tasks Undertaken on Day 1 and Day 2 in Participating Madrasah

Day 1	Day 2
Student Background Questionnaire	School Life Questionnaire
Indonesian language test	Science test
Mathematics test	English test
Principal interview	
School inventory	

All academic tests were answered on Digital Mark Reader (DMR) sheets, which were later scanned. Students completed the student questionnaire by writing on the instrument itself. These data were entered manually following the school visit.

Data were scanned by ACER where possible (i.e., academic test data), and entered manually for others (e.g., the Principal Interview). Data were then analysed, interpreted, and a draft report was written. The draft report was distributed to various stakeholders, who then met at a workshop in Jakarta to discuss the findings and implications, and to provide suggestions about additional work needed for the final report.

DATA ANALYSIS

The data collected was analysed in the following ways:

1. Data cleaning – involved checks regarding consistency and completeness of answers as well as the accuracy of coding and data entry.
2. Psychometric analyses – all achievement tests were subjected to rigorous psychometric analyses by way of classical item analyses and item response theory analyses. Particular attention was given to differential item functioning depending on student gender.
3. Sample statistics, sampling error and variances were calculated (Appendix C).
4. Achievement scores were calculated for every student who participated in the study (Chapter 4).
5. Descriptive analyses by gender and region conducted for all achievement tests (Chapter 4).
6. Descriptive statistics were generated for all variables in the Student Background Questionnaire (Chapter 3), the Principal Interview (Chapter 6) and the School Inventory (Chapter 7).
7. Descriptive analyses were undertaken on responses to the School Life Questionnaire and results reported by gender and region (Chapter 5).
8. Achievement data was merged to the data files containing the information collected from the student background questionnaire.
9. Correlation analyses was undertaken to examine which of the student background variables are related to student achievement (Chapter 8).
10. Student scores for the achievement tests and the School Life Questionnaire were aggregated to the school level and merged onto the data file containing the information collected from the Principal Interview and the School Inventory.
11. Correlation analyses were undertaken to examine which of the school level variables are related to student achievement (Chapters 9 and 10).

► Photo: Peter Riddell-Carre

3 | BACKGROUND OF MADRASAH STUDENTS

3. BACKGROUND OF MADRASAH STUDENTS

This section provides the descriptive findings derived from the Student Background Questionnaire, which assessed: student demographics (age, gender, grade repetition), home context (language at home, work for family, number of meals, place of stay during school week, home resources, parental education); and education context (extra tutorials, expected education); homework (frequency, checking, assistance); absenteeism, grade repetition, and access to library and study materials.

Descriptive results for each of these topics, overall and by region are reported below. All results have been weighted by the final student weight to adjust for the greater likelihood of students from smaller schools entering the sample (see Chapter 2 for more details on sampling methods). In some instances, totals do not add up to 100 percent due to rounding. Please refer to Chapter 8 for information on correlations between student background factors and achievement.

STUDENT DEMOGRAPHICS

Details on mean age (and standard deviation; SD), proportion of girls and boys and grade repetition are shown in Table 3.1. As can be seen in the table, the mean age of the students was 14.5 years (SD = 1 year). This age is expected after nine years of schooling with a school starting age of five years. In addition, the mean age is similar across the three regions. In terms of gender, slightly more than half (52.6%) of all students are female with this proportion being slightly higher in the West (53.1%) and East (54.0%) than in Java (52.2%). About 13 percent of students reported having repeated a grade at least once. Grade repetition was higher in the East (17.8%) than in the West (14.7%) and in Java (11.9%). Overall, over 86 percent of students reported never having repeated a grade with this proportion slightly higher in Java (88.1%) than in the West (85.3%) and East (82.2%).

Figure 3.1 Student Age, Gender and Grade Repetition, by Region

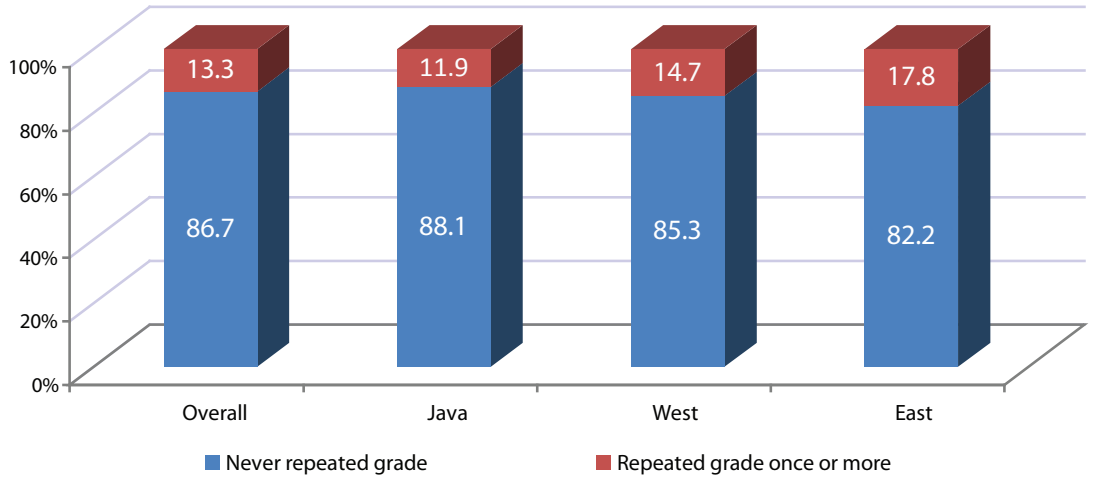


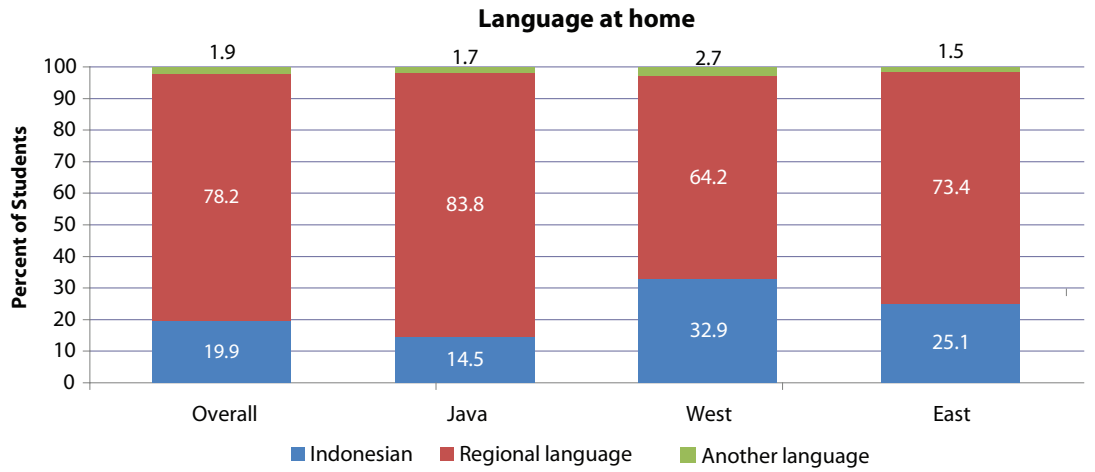
Table 3.1 Student Age, Gender and Grade Repetition, by Region

	N	Mean Age (Years)	SD Age	Girls (%)	Boys (%)	Repeated grade once or more	Never repeated grade
Overall	6233	14.5	1.0	52.6	47.4	13.3	86.7
Java	2335	14.5	1.0	52.2	47.8	11.9	88.1
West	2058	14.6	1.1	53.1	46.9	14.7	85.3
East	1840	14.5	1.1	54.0	46.0	17.8	82.2

HOME CONTEXT

Table 3.2 summarises the information obtained about the language students speak at home and the number of hours they work for the family. It reveals considerable differences across the three regions in terms of main language spoken at home. In Java, only 14.5 percent of students report Indonesian as the language they speak at home most often, while 32.9 percent of those in the West and 25.1 percent of those in the East do. Conversely, over 83 percent of Javanese students report speaking mainly the regional language at home compared with 64.4 percent in the West and 73.3 in the East. In all three regions, very few (1.5% - 2.7%) students report speaking a different language at home most of the time – which perhaps indicates that a very small proportion of students are migrants.

Figure 3.2 Language at Home and Work for Family, by Region



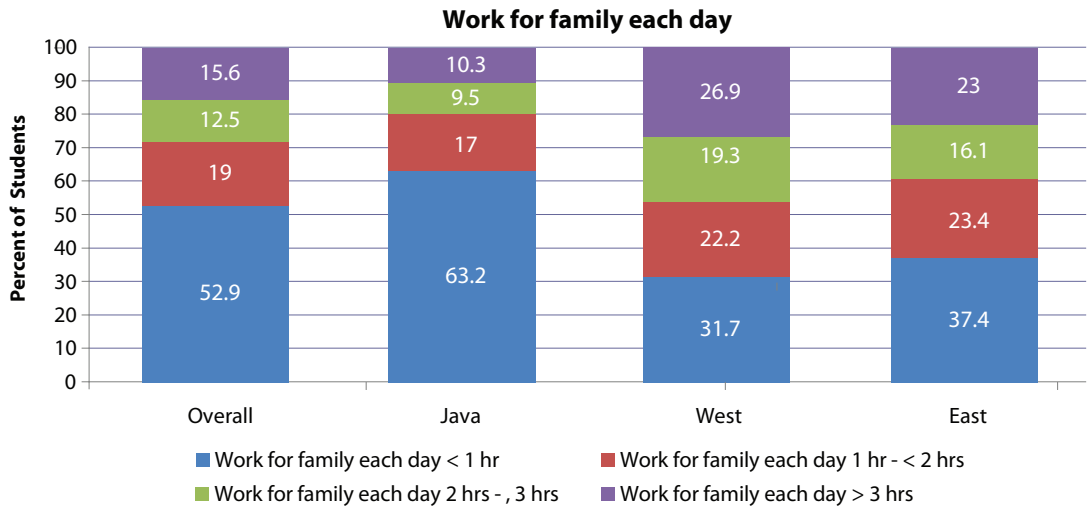


Table 3.2 Language at Home and Work for Family, by Region

	Language at home			Work for family each day			
	Indonesian	Regional language	Another language	< 1 hr	1 hr - < 2 hrs	2 hrs - < 3 hrs	> 3 hrs
Overall	19.9	78.2	1.9	52.9	19.0	12.5	15.6
Java	14.5	83.8	1.7	63.2	17.0	9.5	10.3
West	32.9	64.4	2.7	31.7	22.2	19.3	26.9
East	25.1	73.4	1.5	37.4	23.4	16.1	23.0

Likewise, regional differences emerge with respect to the amount of time students report working for the family each day. The lowest amount of work at home was reported by students in Java where over 63 percent stated that they work less than one hour per day for their family. In the West and East regions, in contrast, only one-third (West: 31.7%; East: 37.4%) report working less than one hour. About one-quarter (West: 26.9%; East: 23.0%) stated that they work more than three hours per day for their families, compared with 10.3 percent in Java. Thus, students in the West and East have considerably less 'free' time than their peers in Java.

Table 3.3 provides information on the number of meals per day as well as the place where students stay during the school week. Only a very small proportion of students (overall 1.3%) report having only one meal per day, with Java and the East having slightly higher proportions (1.4% & 1.5%, respectively) in this category than the West (0.8%). More than half the students have three meals or more per day, with the highest proportion being reported in the West (70.3%), followed by the East (62.8%) and Java (53.9%).

Table 3.3 Number of Meals and Place of Living

	Number of meals per day (%)			Place of living during school week (%)	
	1	2	3 or >	With parents/ legal guardian	Elsewhere (e.g. boarding house)
Overall	19.9	78.2	1.9	52.9	19.0
Java	14.5	83.8	1.7	63.2	17.0
West	32.9	64.4	2.7	31.7	22.2
East	25.1	73.4	1.5	37.4	23.4

With regards to the place where students stay during the school week, results show that the large majority of students live with their parents or legal guardians. Still, about one-quarter of students in the West (24.5%) state that they are staying at another place such as a boarding house (i.e., pesantren).

Details regarding the resources students have at home are given in Table 3.4. In the table, the proportion of students who report having a certain item at home are given in descending order, after details regarding the number of books in students' homes. Having a television is the most frequently reported home possession (82.2%), followed by electricity (69.9%). More than half the students have a handphone (69.9%), a radio (61.2%), a motorcycle (60.5%), a bicycle (60.4%) and/or a desk (50.2%) at home. Home resources that are reported by less than half of the students include piped water (31.5%), refrigerator/freezer (27.7%), cassette player (25.4%), daily newspaper (21.8%), computer (12.6%), car (9.2%), weekly or monthly magazine (8.0%), and/or video cassette recorder (6.3%).

Table 3.4 Students' Home Resources, by Region

Possesion	Overall(%)	Java (%)	West (%)	East (%)
Books at home				
No books	10.2	10.3	9.7	10.4
1 - 10 books	49.1	53.2	38.9	45.5
11 - 30 books	23.8	21.1	30.0	26.5
31 - 50 books	8.5	7.8	11.3	7.1
51 - 100 books	4.2	3.6	6.1	3.7
101 or more books	4.3	3.9	4.0	6.8
Television	82.2	84.6	79.9	74.3
Electricity	75.8	77.9	72.2	71.2
Handphone	69.9	71.5	69.3	63.3
Radio	61.2	67.0	49.0	52.7
Motorcycle	60.5	57.6	72.3	55.3
Bicycle	60.4	62.2	64.1	45.7
Desk	50.2	50.1	49.9	51.5
Digital Video Disc player (DVD)	42.5	42.6	46.0	35.8
Piped water	31.5	32.3	25.4	37.8
Refrigerator/freezer	27.7	22.2	39.1	32.0
Cassette player	25.4	27.5	22.9	19.1
Daily newspaper	21.8	21.0	25.7	19.0
Computer/laptop	12.6	12.0	14.4	12.9
Car	9.2	8.7	12.1	7.3
Weekly or monthly magazine	8.0	7.7	9.9	6.4
Video cassette recorder (VCR)	6.3	5.6	8.3	6.8

There was not a lot of difference across the regions for most home resources. However, possession of a radio did differ – far more Javanese students reported to have a radio (67%) than did students in the West (49%). In contrast, more students in the West reported having a motorcycle (72.3%) and a refrigerator/freezer (39.1%) at home compared with their peers in

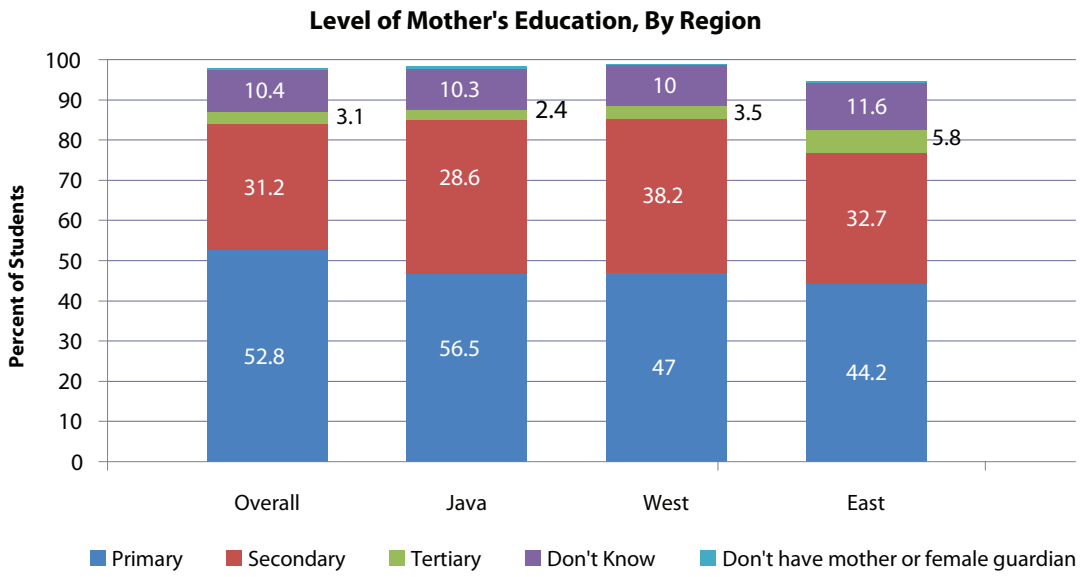
Java (motorcycle: 57.6, refrigerator/freezer: 22.2%). Another considerable difference in home resources was with respect to bicycles – while more than 60 percent of students in the West (64.1%) and Java (62.2%) have a bicycle at home, only 45.7 percent of students in the East report having one.

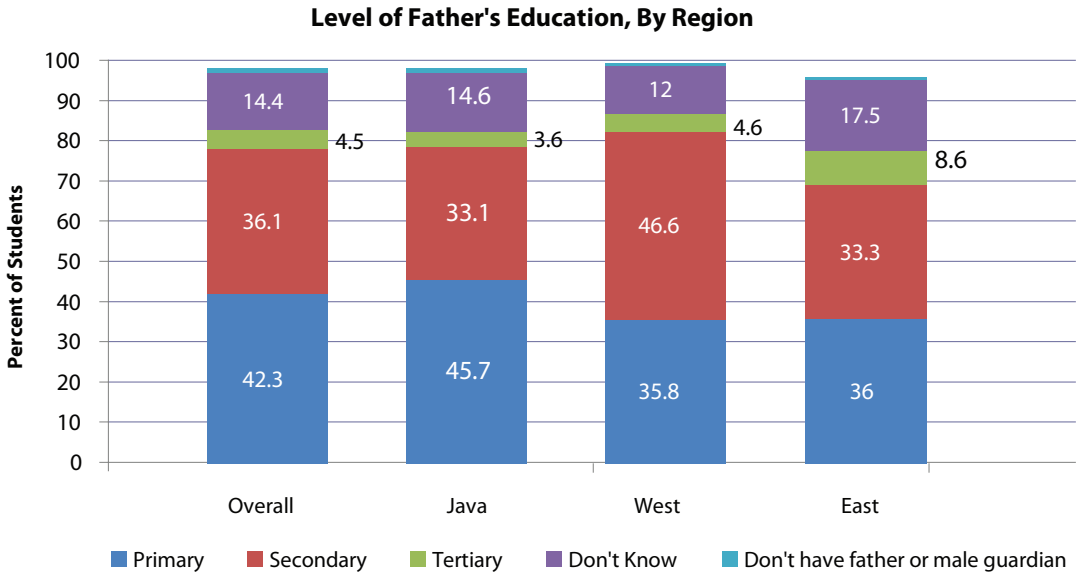
Results concerning parental education are summarised in Table 3.5. As can be seen, fewer students (Overall: 10.4%) do not know their mother's education when compared with their father's education (Overall 14.4%), and the proportion of students who do not know is highest in the East.

Table 3.5 Level of Parental Education, by Region

	Overall	Java	West	East
Mother's education				
Did not go to school	2.1	1.8	1.3	5.5
Completed some grades of primary school	15.9	15.5	15.1	19.8
Completed primary school	36.9	41.0	31.9	24.4
Subtotal primary	52.8	56.5	47.0	44.2
Completed some grades of junior secondary school	5.4	4.6	6.2	8.1
Completed junior secondary school	12.1	11.0	16.1	10.9
Completed some grades of senior secondary school	1.9	1.7	2.4	2.1
Completed senior secondary school	11.8	11.3	13.5	11.6
Subtotal secondary	31.2	28.6	38.2	32.7
Completed a diploma	1.2	1.0	1.4	1.6
Completed a university degree	1.9	1.4	2.1	4.2
Subtotal tertiary	3.1	2.4	3.5	5.8
Don't know	10.4	10.3	10.0	11.6
Don't have mother or female guardian	0.4	0.5	0.1	0.2
Father's education				
Did not go to school	1.7	1.7	0.4	3.8
Completed some grades of primary school	16.1	15.9	14.4	19.9
Completed primary school	26.2	29.8	21.4	16.1
Subtotal primary	42.3	45.7	35.8	36.0
Completed some grades of junior secondary school	6.1	5.1	8.6	6.6
Completed junior secondary school	12.4	11.4	17.2	9.5
Completed some grades of senior secondary school	2.6	2.1	3.6	3.4
Completed senior secondary school	15.0	14.5	17.2	13.8
Subtotal secondary	36.1	33.1	46.6	33.3
Completed a diploma	0.9	0.7	0.9	1.9
Completed a university degree	3.6	2.9	3.7	6.7
Subtotal tertiary	4.5	3.6	4.6	8.6
Don't know	14.4	14.6	12.0	17.5
Don't have father or male guardian	1.0	1.2	0.5	0.7

Figure 3.5 Level of Parental Education, By Region





In regards to mother's education, slightly more than half of the students have mothers who attended primary school (Overall: 52.8%), with a slightly higher percentage in Java (56.5%) than in the West (47%) or the East (44.2%). The highest proportion of mothers who have had some exposure or completed secondary schooling was recorded for the West (38.2%), followed by the East (32.7%) and Java (28.6%). The highest proportion of tertiary completions was for the East (5.8%), followed by the West (3.5%) and Java (2.4%).

A similar picture emerged for father's education. For Java, the largest proportion of primary school exposure or completion was recorded for Java (45.7%; compared to the West: 35.8% and East: 36.0%), whereas the highest secondary exposure or completion was recorded for the West (46.6%; compared with Java: 33.1% and East: 33.3%). Finally, the East had the largest proportion of tertiary completions (8.6%) followed by the West (4.6%) and Java (3.6%). Thus, in summary slightly higher levels of education were recorded for fathers and in the East.

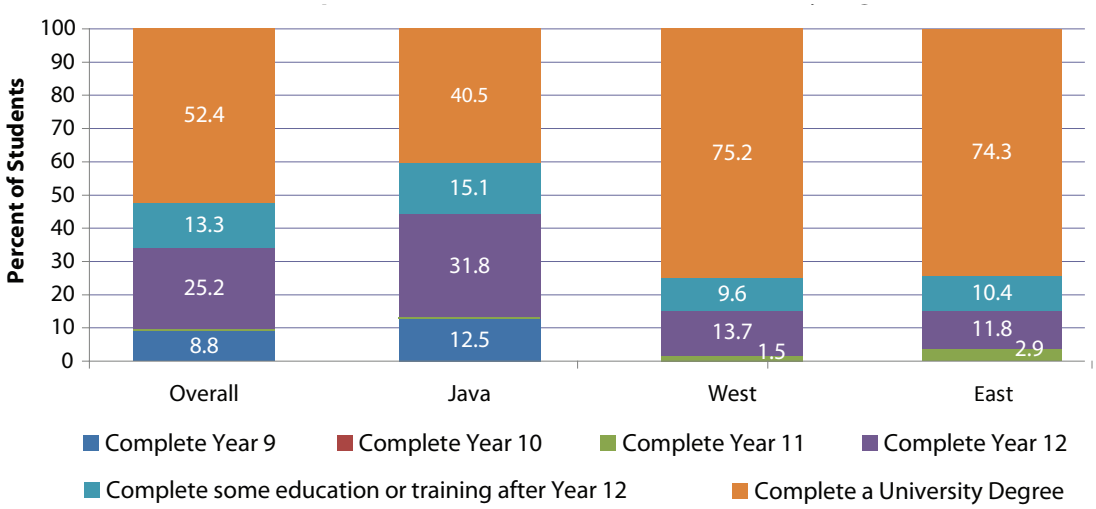
EDUCATIONAL CONTEXT

Table 3.6 details students' expected level of educational attainment overall and separately for each region. The table shows considerable differences between the regions. The lowest level of expected education was for Java, where the percentage of students expecting to complete Year 9 or Year 12 is higher than it is for all students. At the same time, students in the East and West have much higher expectations regarding their level of education, in that about three-quarters (East: 74.3%; West 75.2%) expect to complete a university degree compared with only 40 percent (40.5%) in Java. To a certain extent this reflects the higher level of parental education in the East and the West (see the section on "home context" above) as the level of education students expect to attain is influenced by both the parents as role models as well as the educational aspirations for their children.

Table 3.6 Students' Expected Level of Educational Attainment, by Region

	Overall	Java	West	East
Complete Year 9	8.8	12.5	1.5	2.9
Complete Year 10	0.1	0.1	0.1	0.1
Complete Year 11	0.2	0.1	0.0	0.5
Complete Year 12	25.2	31.8	13.7	11.8
Complete some education or training after Year 12	13.3	15.1	9.6	10.4
Complete a university degree	52.4	40.5	75.2	74.3

Figure 3.6 Students' Expected Level of Educational Attainment, by Region



Students were also asked about the subjects in which they were taking tutorials outside of school and the amount of time spent on them. The results from these questions are provided in 3.7. First, English is the subject in which the largest number of students take tutorials outside school (39.7%), followed by Science (31.6%), Mathematics (30.4%) and Indonesian (27.8%). Second, the differences across regions are quite striking in this matter. In the West, around 70 percent of students reported taking extra tutorials, whereas only around 20 percent of Javanese students and about one-third of those in the East reported doing so.

Table 3.7 Percent of Students Taking Extra Tutorials & Time Spent in Tutorials, by Region

	Overall	Java	West	East
% students report taking extra tutorials in:				
Mathematics	30.4	18.7	71.6	32.0
Science	31.6	20.3	68.4	35.9
English	39.7	28.7	78.1	39.5
Indonesian	27.8	18.1	65.9	27.9
Amount of time spent on extra tutorials:				
Mathematics				
1 hour per week	18.8	18.1	24.7	10.2
2 hours per week	66.1	65.2	66.8	68.7
More than 2 hours per week	15.1	16.7	8.5	21.1
Science				
1 hour per week	28.6	30.9	25.0	24.3
2 hours per week	55.9	52.5	57.2	69.6
More than 2 hours per week	15.5	16.6	17.8	6.1
English				
1 hour per week	15.1	10.9	25.7	20.7
2 hours per week	72.3	80.8	58.3	46.8
More than 2 hours per week	12.6	8.3	16.0	32.6
Indonesian				
1 hour per week	21.5	20.8	24.8	17.6
2 hours per week	62.7	64.6	59.8	60.6
More than 2 hours per week	15.8	14.6	15.4	21.9

With respect to the amount of time spent on extra tutorials, the majority of students reported taking tutorials for two hours per week, regardless of the subject area. Again, English stands out in that it has the highest proportion of students reporting spending two hours per week in extra tutorials (72.3%), compared with 62.7 percent for Indonesian, 55.9 percent for Science and 66.1 percent for Mathematics. English is also the subject with the largest differences across regions in the amount of time spent on extra tutorials. While more than 80 percent of Javanese students (80.8%) stated that they spend more than two hours on extra tutorials in English, only 46.8 percent of those in the East did. In contrast, nearly one-third of students who take English tutorials in the East report spending more than two hours per week in these tutorials, compared with 8.3 percent of the Javanese students.

Following a question on the number of lessons per week in Mathematics, Science, Indonesian and English as contextual information, a suite of questions revolved around the homework practices in the different subject areas. These questions covered the frequency with which: (i) students were assigned homework in different subjects, (ii) teachers checked this homework and (iii) students received homework assistance by someone other than their teacher.

The results of the number of lessons per week students reported receiving instruction in Mathematics, Science, Indonesian and English are presented in Table 3.8. The low percentages recorded for the category "no time" reflects the fact that this category was primarily designed for the sake of completeness rather than as a substantive response option. As can be seen, about

one-third of students across all regions report having about two to three lessons in each of the four subject areas (Mathematics: 33.2%; Science: 36.1%; Indonesian: 34.7%; English: 31.9%).

Table 3.8 Lessons per week in Mathematics, Science, Indonesian & English, by Region

	Overall	Java	West	East
Mathematics				
No time	0.3	0	1.1	0.6
Fewer than 2 lessons a week	8.7	3.9	18.5	16.6
2-3 lessons a week	33.2	32.5	32.3	38.4
4 or more lessons a week	57.8	63.6	48.1	46.4
Science				
No time	0.2	0	0.5	0.9
Fewer than 2 lessons a week	7.1	1.8	18.7	14.8
2-3 lessons a week	36.1	34.4	36.2	44.9
4 or more lessons a week	56.6	63.9	44.6	39.4
Indonesian				
No time	0.4	0	0.8	1.8
Fewer than 2 lessons a week	8.8	2.1	21.3	21.8
2-3 lessons a week	34.7	32.9	37.4	38.9
4 or more lessons a week	56.2	65.0	40.5	37.6
English				
No time	0.3	0	0.6	1.2
Fewer than 2 lessons a week	6.3	2.0	14.1	15.6
2-3 lessons a week	31.9	29.6	37.0	34.9
4 or more lessons a week	61.5	68.3	48.2	48.3

Students in the regions, however, differ with respect to the other two frequency categories. About two-thirds of Javanese students report receiving four or more lessons a week in all subject areas (Mathematics: 63.6%; Science: 63.9%; Indonesian: 65%; English: 68.3%). In the other two regions, in contrast, the percentage of students stating that they receive four or more lessons a week in a subject range from 40.5 percent in Indonesian in the West to 48.3 percent of students reporting four or more lessons a week in English. The reverse applies at the lower end of the frequency scale where less than four percent of students in Java report receiving fewer than two lessons in any of the subjects compared with 14.1 percent choosing that category for English in the West to 21.8 percent who select that category for Indonesian in the East.

As far as Indonesian is concerned, the lower number of lessons per week in the East and the West than in Java might make sense given that fewer students speak Indonesian at home in Java than in the East and the West (see Table 3.2). Overall, however, these differences beg the question as to which subjects not covered in the current study are taught more frequently in Eastern and Western MTs when compared to their Javanese counterparts if one assumes that the lesson time across all subjects is the same across all MTs in Indonesia.

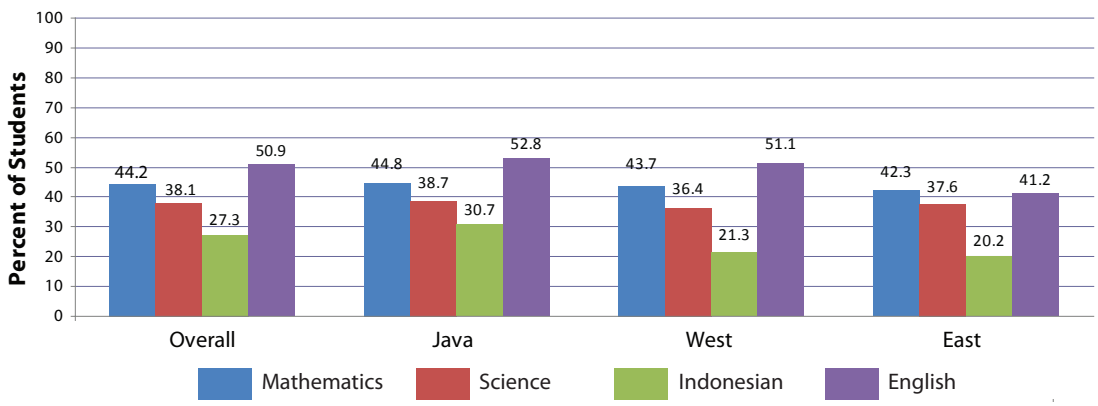
Table 3.9 reveals some interesting insights concerning the frequency of homework that students in MTs are assigned. The subject for which homework is assigned most frequently is English – 50.9 percent of all students report doing English homework twice a week or more. This compares with 44.2 percent of students reporting doing homework twice a week or more in Mathematics,

38.1 percent in Science and 27.3 percent in Indonesian. At the other extreme, Indonesian is the subject with the highest occurrence of no homework, particularly in the East (18.2%) and the West (13%).

Table 3.9 Frequency of Homework, by Region

	Overall	Java	West	East
Mathematics				
No homework given	2.2	1.7	3.3	2.7
Once or twice a month	9.4	8.0	10.8	14.1
Once a week	44.2	45.5	42.2	40.9
Twice a week or more	44.2	44.8	43.7	42.3
Science				
No homework given	3.8	3.8	3.6	4.0
Once or twice a month	14.9	15.0	13.8	16.2
Once a week	43.3	42.5	46.3	42.2
Twice a week or more	38.1	38.7	36.4	37.6
Indonesian				
No homework given	6.6	2.2	13.0	18.2
Once or twice a month	16.3	18.6	12.1	11.6
Once a week	49.8	48.5	53.6	50.0
Twice a week or more	27.3	30.7	21.3	20.2
English				
No homework given	2.6	2.2	4.2	1.9
Once or twice a month	8.9	8.8	8.2	10.6
Once a week	37.6	36.2	36.5	46.4
Twice a week or more	50.9	52.8	51.1	41.2

Figure 3.9 Frequency of Homework, by Region (Twice a week or more)

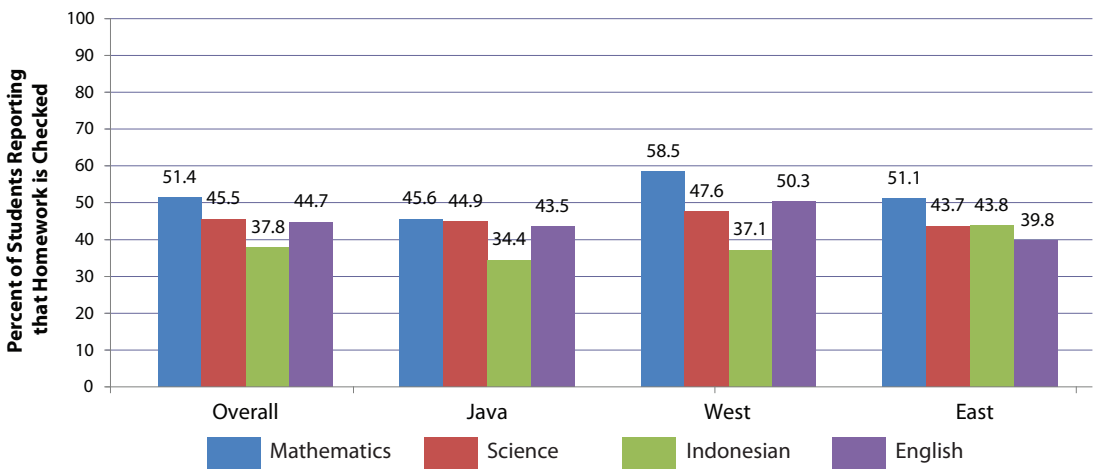


Arguably, students learn more from doing homework if their work is checked by their teacher. Table 3.10 shows how often teachers check their students' homework in the different subject areas. While across all subject areas "always" is the category that is ticked most frequently by students, the highest percentage (51.4%) is recorded for Mathematics, followed by Science (45.5%), English (44.7%) and Indonesian (37.8%). Mathematics is, however, also the subject with the greatest differences across regions – 58.5 percent of students in the West reported having their Mathematics homework checked always by their teachers compared with 45.6 percent in Java.

Table 3.10 Frequency with which Teacher Checks Homework, by Region

	Overall	Java	West	East
Mathematics				
Never	2.8	2.8	2.1	3.5
Sometimes	17.9	26.2	11.7	14.1
Often	27.9	25.4	27.7	31.3
Always	51.4	45.6	58.5	51.1
Science				
Never	2.3	2.8	1.4	2.9
Sometimes	22.9	29.4	18.1	19.8
Often	29.3	22.9	32.9	33.7
Always	45.5	44.9	47.6	43.7
Indonesian				
Never	3.6	3.5	4.3	2.8
Sometimes	27.1	35.1	23.2	19.8
Often	31.5	27.0	35.3	33.6
Always	37.8	34.4	37.1	43.8
English				
Never	2.5	2.9	1.6	3.0
Sometimes	24.2	31.4	17.0	22.9
Often	28.7	22.1	31.2	34.2
Always	44.7	43.5	50.3	39.8

Figure 3.10 Percentage of Teachers that Always Check Homework, by Region



Students were also asked how frequently a person other than their teacher assisted them with their homework. Results are shown in Table 3.11, and indicate that about three-quarters of students receive assistance with their homework sometimes, while almost 20 percent never receive help. This picture is similar across the three regions. Thus, in summary, homework is assigned more frequently in English and Mathematics than in Science and Indonesian. Further, when Indonesian homework is assigned, it gets checked by teachers the least often. Finally, a large majority of students receives assistance with their homework by a person other than their teacher, but about one in five students never receive help with their homework.

Table 3.11 Help with Homework from a Person Other Than Teacher, by Region

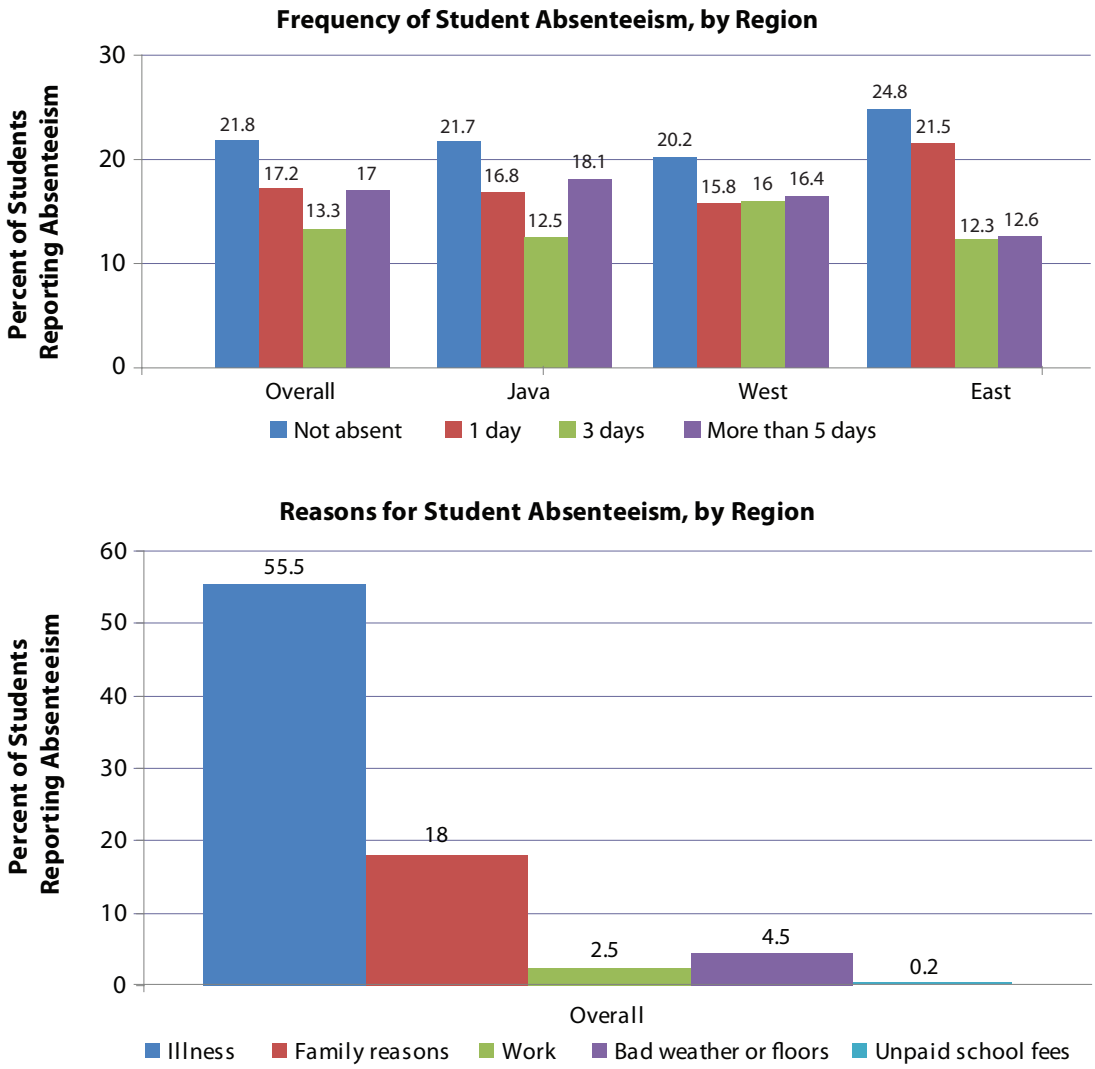
	Overall	Java	West	East
I don't get homework	0.5	0.7	0.2	0.5
Never	19.3	18.7	19.9	21.2
Sometimes	73.5	75.8	68.8	70.2
Most of the time	6.7	4.9	11.1	8.2

Students were also asked about the frequencies of and reasons for their absenteeism and the availability of study materials including library books and textbooks. Table 3.12 shows that over 20 percent of students had not been absent. It should be noted that students were asked to report their absences since the beginning of the school year and that the study was conducted during the months of October and November 2009. About the same proportion of students reported having been absent from school only one or two days (17.2% and 17.3%, respectively). A similar proportion (17%) stated that they were absent for more than five days, which means that these students missed one week of school or more. Results by region show that absenteeism is slightly lower in the East than in Java and the West. The main reason for students' absences is illness (55%), followed by family reasons (18%). The reasons for the regional differences cannot be teased out fully by the data in the current study. Perhaps parents and students in the West have different beliefs about education than parents in Java and the East. It would therefore be interesting to investigate reasons for absence in further detail in future work in this area.

Table 3.12 Frequency of Student Absenteeism, by Region

	Overall	Java	West	East
Frequency of absenteeism				
Not absent	21.8	21.7	20.2	24.8
1 day	17.2	16.8	15.8	21.5
2 days	17.3	16.7	18.7	18.2
3 days	13.3	12.5	16.0	12.3
4 days	6.6	6.7	6.2	6.9
5 days	6.8	7.5	6.7	3.7
More than 5 days	17.0	18.1	16.4	12.6
Reason for absence				
Illness	55.5	56.8	54.9	49.7
Family reasons (e.g. wedding, funeral)	18.0	18.6	16.7	16.8
Work	2.5	1.2	4.2	5.8
Bad weather or floods	4.5	2.6	9.6	5.5
Unpaid school fees	0.2	0.1	0.2	0.5

Figure 3.11 Frequency of and Reasons for Student Absenteeism, by Region



Finally, students were asked about the availability of different study materials (see Table 3.13). Results show that about half the students are able to borrow books from a school or class library to take home whereas the other half is not allowed to borrow books. With regards to textbooks, about two-thirds of students reported having a textbook in Mathematics, Science, Indonesian and English. This is an interesting finding on two fronts. First, the Minimum Standards Requirement in Indonesia specifies that students must have one textbook for each subject area they take. Second, the Schools Operational Assistance program (BOS) has been providing principals with finances to assist in the running of schools, and in turn, to aid the Government's commitment to ensure free basic education for all children in Indonesia. Additional BOS funding, referred to as BOS Books (BOS Buku in Indonesian), was given to principals in 2007 for purchasing textbooks (The World Bank, 2010).

Table 3.13 Availability of Study Materials, by Region

	Overall	Java	West	East
Possibility of borrowing books				
No - Borrowing impossible	47.0	47.1	49.7	42.5
Yes – Borrowing possible	53.0	52.9	50.3	57.5
Textbooks				
Mathematics	64.9	66.2	61.7	63.4
Science	63.4	65.8	61.2	54.8
Indonesian	62.5	63.0	62.1	61.0
English	61.0	61.1	61.2	59.8
Other materials				
Pencil	91.9	94.0	90.4	83.7
Pencil sharpener	43.6	39.4	57.5	41.6
Pencil eraser	76.0	78.3	76.3	64.3
Ruler	70.6	71.7	68.1	69.0
Pen	91.5	93.6	89.2	84.4
School bag	89.5	91.3	84.9	87.8
Calculator	20.5	21.4	18.0	19.9

In regard to the availability of other materials, the majority of students have a pencil (91.9%), a pen (91.5%) and a school bag (89.5%). About three-quarters of students have a pencil eraser (76.0%) and a ruler (70.6%). Less than half of all students have a pencil sharpener (43.6%) and only 20.5 percent of students have a calculator. Results by region illustrate that students in the East tend to be the least well equipped with study materials, followed by their peers in the West while students in Java record slightly higher levels of availability of study materials.

SUMMARY

In this chapter, information obtained from the student questionnaire was summarised in terms of demographics, home context, and educational context. Results provided interesting insights into these aspects as reported by Year 9 students in MTs and included the following:

- Slightly more girls (52.6%) than boys (47.4%) attend Year 9 MTs.
- About one in ten Year 9 students has repeated a grade (13.3%).
- Indonesian is spoken at home more in the West (32.9%) and the East (25.1%) than in Java (14.5%), where a higher proportion of students speak a regional language at home (83.8%) than in the East (73.4%) and in the West (64.4%).
- The highest proportion of students living in a boarding house/ pesantren during the school week is in the West (24.5%), compared with 15.8% in Java and 18.8% in the East.
- About 10 percent of students in all regions have no books at home while about three-quarters (72.9%) have access to between 1 and 30 books.
- Students in the East report the highest proportion of parents with tertiary education while students in the West report the highest proportion of parents with secondary education, and students in Java reported the highest proportion of parents with primary education.

- Probably reflective of this higher level of parental education, students in the East and West have a far higher level of expected education than students in Java. While about three-quarters of students expect to complete a university degree only 40.5 percent of students in Java expect to attain this level of education.
- Large differences were recorded with respect to extra tutorials: By far the highest proportion of students taking extra tutorials is recorded for the West (around 70%) compared to around 30 percent in the East and around 20 percent in Java. Most of the time students spend on English tutorials.
- English and Mathematics are the subjects in which homework is assigned more frequently than in Science and Indonesian. The latter subject is also the subject that homework – when it is assigned – gets checked by teachers the least often.
- Only two-thirds of students in all regions have textbooks in Mathematics, Science, Indonesian and English.

► Photo: M Wildan

4 STUDENT ACHIEVEMENT

4. STUDENT ACHIEVEMENT

This chapter details the results of the four academic achievement tests undertaken by students (Mathematics, Science, Indonesian, English). Analyses were conducted for the overall sample and for each region. The findings from these analyses are presented separately for each of the tests. All results were weighted by the final student weight to adjust for the greater likelihood of students from smaller schools entering the sample (see Chapter 2 for more detail). Comparisons with international data were made where applicable. The results do not take into account standard errors.

MATHEMATICS

Table 4.1 provides the aggregated findings for the Mathematics test – for the overall sample as well as separately for the three regions. Overall (across the entire sample), students correctly answered 14 of the 30 items on the Mathematics test (SD = 5.4). On average, students from Java performed slightly better on the Mathematics test than students from the East and the West, who performed at similar levels. Nonetheless, on average, students were able to answer less than half of the test items. The lowest score on the test was 2 while the highest was 30, and there was not much variation across the regions. Further, 3.9 percent of the overall sample correctly answered five or fewer items, which is somewhat lower than the 6.4 and 6.1 percent shown in the East and West, respectively. However, only 2.6 percent of the sample in Java scored five or fewer on the Mathematics test. Conversely, a higher proportion of students from Java correctly answered 25 or more items on the Mathematics test (4.1%), compared to the overall sample (3.4%), the East (1.1%) and the West (1.4%).

Table 4.1 Performance Within Each Region on the Mathematics Test

Region	Mean % Correct (SD)	Minimum	Maximum	≤ 5	≥25
Overall	14.0	2	30	3.9	3.4
	(5.4)				
East	12.2	2	30	6.4	1.1
	(5.1)				
Java	14.8	2	30	2.6	4.1
	(5.5)				
West	12.5	2	29	6.0	2.3
	(5.0)				

Each of the Mathematics test items was analysed separately to investigate the percentage of students who correctly answered the item. The findings from these analyses are shown in Table 4.2. The table shows that more than 70 percent of students correctly answered three of the Mathematics items (items 1, 2 and 3). This finding is expected given that these items were derived from IBT Year 4, and according to Indonesian curriculum, the information covered by items 1, 2 and 3 is to be covered in Year 2, 3 and 6, respectively. On the other hand, items 24 and 29 were the most difficult items on the Mathematics test – answered by less than 20 percent of students. Both of these items were derived from TIMSS 2007 Year 8 items.

Table 4.2 Percent Correct for Each Item on the Mathematics Test

Item No	% Correct	Indonesian Mathematics Curriculum Strand	Item No	% Correct	Indonesian Mathematics Curriculum Strand
1	79.5	Number	16	51.2	Geometry & Measurement
2	77.0	Number	17	43.2	Number
3	70.6	Data Management	18	38.6	Data Management
4	60.1	Geometry & Measurement	19	37.7	Algebra
5	67.9	Data Management	20	27.7	Algebra
6	64.3	Number	21	40.9	Number
7	59.9	Geometry & Measurement	22	37.8	Geometry & Measurement
8	54.4	Number	23	36.6	Geometry & Measurement
9	52.7	Number	24	18.7	Number
10	57.0	Data Management	25	28.3	Algebra
11	50.1	Geometry & Measurement	26	33.1	Number
12	48.9	Geometry & Measurement	27	32.2	Geometry and Measurement
13	50.4	Algebra	28	28.4	Number
14	33.0	Number	29	19.1	Algebra
15	42.4	Geometry & Measurement	30	21.7	Data Management

SCIENCE

Table 4.3 provides the aggregated findings of the Science test, overall and for each of the three regions. Overall, students correctly answered almost 16 of the 30 Science items (SD = 5). The lowest score on the test was 2 while the highest was 30, and again, there was little variation across the regions. As with the Mathematics test, on average, students from Java performed slightly better on the Science test than students from the other two regions. Only 1 percent of

the overall sample correctly answered five or fewer items, and this proportion was relatively similar across the three regions. Almost 4 percent of the overall sample correctly answered 25 or more items on the test. However, a higher proportion of students from Java correctly answered 25 or more items than students from the other two regions, with the West outperforming their Eastern counterparts (2.6% vs 1.6% students answering 25 or more items correctly).

Table 4.3 Performance Within Each Region on the Science Test

Region	Mean % Correct (SD)	Minimum	Maximum	≤ 5	≥25
Overall	15.6	2	30	1.0	3.9
	(5.0)				
East	14.3	2	29	1.6	1.6
	(4.8)				
Java	16.2	3	30	0.8	4.8
	(5.0)				
West	14.7	2	29	1.4	2.6
	(4.7)				

Table 4.4 Percent Correct for Each Item on the Science Test

Item No	% Correct	Indonesian Mathematics Curriculum Strand
1	90.5	Earth & solar system
2	82.4	Energy & changes
3	73.0	Matter & their characteristics
4	70.5	Living things & life processes
5	74.3	Living things & life processes
6	70.4	Earth & solar system
7	69.8	Matter & their characteristics
8	61.8	Living things & life processes
9	66.0	Earth & solar system
10	55.8	Energy & changes
11	68.9	Living things & life processes
12	56.3	Energy & changes
13	51.1	Living things & life processes
14	49.4	Living things & life processes
15	42.5	Living things & life processes

Item No	% Correct	Indonesian Mathematics Curriculum Strand
16	51.1	Living things & life processes
17	46.8	Living things & life processes
18	43.7	Energy & changes
19	41.8	Earth &solar system
20	40.6	Living things & life processes
21	44.2	Energy & changes
22	38.8	Earth & solar system
23	31.6	Energy & changes
24	33.8	Energy & changes
25	43.6	Living things & life processes
26	30.8	Earth & solar system
27	32.6	Living things & life processes
28	35.5	Energy & changes
29	29.3	Energy & changes
30	35.9	Living things & life processes

Each of the Science test items was analysed separately to investigate the percentage of students who correctly answered the item. The findings from these analyses are shown in Table 4.4 above. The table shows that six of the Science items were correctly answered by more than 70 percent of students, with items 1 and 2 being answered correctly by 90.5 and 82.4 percent of students, respectively. Four of these items were derived from IBT 6, one from IBT 4 and one from TIMSS 2007 Year 8. There was a mix of curriculum strands as well – two each from Earth, Physical and Life Sciences. While there were no items incorrectly answered by more than 80 percent of the sample, item 29 was the most difficult – being answered correctly by only 29.3 percent of students. Item 29 tested knowledge of Physical Science. Therefore, as with the Mathematics test

data, there were no clear curriculum strands where students showed strengths or weaknesses. Thus, the data do not provide information on what content areas teachers ought to focus on in more detail (see Table 4.4 for further information).

MATHEMATICS AND SCIENCE: INTERNATIONAL COMPARISONS

The Mathematics and Science test items derived from TIMSS Year 8 and IBT Years 4, 6 and 8 were analysed. The proportion correct for the students in the QEM study were compared to the proportion correct for the Indonesian TIMSS sample, the International TIMSS sample and the IBT comparison samples. The findings from these analyses are provided in Tables 4.5 and 4.6 (for Mathematics) and 4.7 and 4.8 (for Science). Overall, the QEM sample performed better on the Mathematics test when compared to both TIMSS and IBT data, but for Science, the QEM sample performed less well. This difference is likely attributable to the make-up of the two tests, whereby the Mathematics test used a number of Year 4 items, while the Science test used more Year 6 and Year 8 items.

Table 4.5 Average Mathematics Performance (Percent Correct) in QEM and TIMSS

QEM Item No	Origin	TIMSS Strand	Indonesian Curriculum Strand	QEM	TIMSS Indonesia	TIMSS International
10	M022181	Data & Chance	Data Management	57.0	65.9	71.9
13	M032704	Algebra	Algebra	50.4	52.3	59.5
14	M022104	Number	Number	33.0	46.2	57.5
15	M042148	Geometry	Geometry & Measurement	42.4	56.4	62.8
18	M022101	Data & Chance	Data Management	38.6	43.3	59.4
20	M032198	Algebra	Algebra	27.7	36.2	46.6
21	M042055	Number	Number	40.9	38.0	45.5
24	M022066	Number	Number	18.7	33.8	43.6
25	M042267	Algebra	Algebra	28.3	25.9	33.9
29	M042082	Algebra	Algebra	19.1	22.4	34.2
30	M042222	Data & Chance	Data Management	21.7	28.2	39.2

Table 4.5 shows that on average, the QEM sample correctly answered the TIMSS items less often than the international TIMSS sample did. A similar pattern was evident when the QEM data were compared to the Indonesian TIMSS data. However, there were exceptions. For example, the QEM sample correctly outperformed the Indonesian TIMSS sample on items 21 and 25 (see Table 4.5 for more information). Both of these items are designed to assess the content domain of 'Number'.

Table 4.5 shows that the QEM sample performed more poorly than both the Indonesian TIMSS sample and the international TIMSS sample on 9 of the 11 items. For items 21 and 25, the QEM sample outperformed the Indonesian TIMSS sample, but not the international TIMSS sample. The domains measured by these items were number and algebra, respectively. There is no clear evidence that students in the QEM study outperformed or underperformed the international comparison samples in the areas of Number or Algebra. However, the Data and Chance findings (Data Management in Indonesia) show that both the QEM sample and the Indonesian TIMSS sample performed more poorly than the international TIMSS sample and this difference was more pronounced in the QEM sample.

Table 4.6 Average Mathematics Performance (Percent Correct) in QEM and IBT*

QEM Item No	Origin	TIMSS Strand	Indonesian Curriculum Strand	QEM	IBT
1	IBT 4	Number	Number	79.5	66.8
2	IBT 4	Number	Number	77.0	85.6
3	IBT 4	Data & Chance	Data Management	70.6	65.6
4	IBT 4	Measurement	Geometry & Measurement	60.1	56.1
5	IBT 6	Data & Chance	Data Management	67.9	67.9
6	IBT 4	Number	Number	64.3	53.3
7	IBT 4	Measurement	Geometry &Measurement	59.9	42.6
8	IBT 4	Number	Number	54.4	51.1
9	IBT 4	Number	Number	52.7	53.7
11	IBT 8	Measurement	Geometry & Measurement	50.1	71.7
12	IBT 6	Geometry	Geometry & Measurement	48.9	48.6
16	IBT 4	Measurement	Geometry & Measurement	51.2	35.4
17	IBT 6	Algebra	Number	43.2	10.8
19	IBT 8	Algebra	Algebra	37.7	29.0
22	IBT 8	Measurement	Geometry & Measurement	37.8	68.1
23	IBT 4	Measurement	Geometry &Measurement	36.6	33.1
26	IBT 6	Number	Number	33.1	55.4
27	IBT 4	Number	Geometry & Measurement	32.2	27.0
28	IBT 8	Number	Number	28.4	76.4

** The QEM sample was Year 9, and the IBT data were derived from Year 4, 6 & 8 test data.*

Table 4.6 shows that on average, the QEM sample performed more highly on the IBT Mathematics items than did the IBT comparative samples. However, significant caution must be taken when interpreting these findings as the QEM sample tested Year 9 students and the IBT data were derived from Years 4, 6 and 8 sample data.

When Table 4.6 is inspected more closely, it is found that for most of those items where the QEM sample outperformed the IBT sample, the item was derived from the Year 4 IBT test. This finding is therefore somewhat expected. Further, performance on the Year 6 IBT items appears to be more closely aligned in the two samples, at least for items 5 and 12. Item 17 however, showed that a significantly higher proportion of the QEM sample were able to correctly answer the item compared to the Year 6 comparison group. But the opposite was noted for item 26 – where the QEM sample correctly answered the item significantly less frequently than the IBT sample. There were also differences in performance across the Year 8 IBT items. While the QEM sample performed better than the IBT sample on item 19, they performed worse on items 11 and 28. There was no clear pattern in performance across the domains. Overall, these findings suggest that Year 9 Madrasah students are performing at about the level of Year 6 students internationally in Mathematics. However, caution must be taken with this statement as the data do not take into account standard errors, and the test included only limited Year 6 items from an international test.

Table 4.7 Average Science Performance (Percent Correct) in QEM and TIMSS

QEM Item No	Origin	TIMSS Strand	Indonesian Curriculum Strand	QEM	TIMSS Indonesia	TIMSS International
2	S012037)8	Physical Science	Energy & changes	82.4	84.0	84.5
4	S032607)8	Life Science	Living things & life processes	70.5	54.0	63.2
5	S032606	Life Science	Living things & life processes	74.3	82.5	77.1
10	S022058)8	Physical Science	Energy & changes	55.8	60.6	62.9
12	S022041)8	Physical Science	Energy & changes	56.3	61.1	70.9
14	S032385	Life Science	Living things & life processes	49.4	55.2	63.0
16	S042054	Life Science	Living things & life processes	51.1	73.4	64.4
18	S022040)8	Physical Science	Energy & changes	43.7	46.8	59.5
19	S042150	Earth Science	Earth & solar system	41.8	38.3	48.8
21	S032257	Physical Science	Energy & changes	44.2	26.7	35.7
22	S012027	Earth Science	Earth & solar system	38.8	43.6	72.6
23	S032425	Physical Science	Energy & changes	31.6	38.4	46.7
24	S012003)8	Physical Science	Energy & changes	33.8	56.8	69.5
25	S032083)8	Life Science	Living things & life processes	43.6	10.2	28.1

Table 4.7 shows that on average, the QEM sample correctly answered 3 of the 14 TIMSS Science items more often than both the Indonesian TIMSS sample and the international TIMSS sample did. Those items were items 4, 21, 25, and measured the domain of either Life Science or Physical Science. In addition, the QEM sample outperformed the Indonesian TIMSS sample (but not the international sample) on items 19 (Earth & Solar System). There was therefore no clear pattern in performance across the domains.

Table 4.8 shows that on average, the QEM sample performed more highly on 9 of the 24 IBT Science items when compared to the international samples. However, caution must be taken when interpreting these findings as the QEM sample tested Year 9 students and the IBT data were derived from Years 4, 6 and 8 sample data.

As with the Mathematics test, QEM students tended to fare better than the comparative sample on the Year 4 Science Items. Although this was not evident for all items – items 9 and 13 were correctly answered less often by the QEM sample. Of the 11 Year 6 items, only 3 were answered correctly more often by the QEM sample. There were also differences in performance across the Year 8 IBT items. Only one of the seven Year 8 items had a higher proportion correct for the QEM sample when compared to the IBT sample (item 25). Again, there was no clear pattern in performance across the domains.

Table 4.8 Average Science Performance (Percent Correct) in QEM and IBT*

QEM Item No	Origin	TIMSS Strand	Indonesian Curriculum Strand	QEM	IBT
1	IBT 4	Earth Science	Earth & solar system	90.5	84.6
2	IBT 6	Physical Science	Energy & changes	82.4	78.4
3	IBT 6	Physical Science	Matter & their characteristics	73.0	84.2
4	IBT 6	Life Science	Living things & life processes	70.5	57.8
6	IBT 6	Earth Science	Earth & solar system	70.4	55.5
7	IBT 4	Physical Science	Matter & their characteristics	69.8	66.2
8	IBT 6	Life Science	Living things & life processes	61.8	82.0
9	IBT 4	Earth Science	Earth & solar system	66.0	80.5
10	IBT 8	Physical Science	Energy & changes	55.8	72.5
11	IBT 4	Life Science	Living things & life processes	68.9	61.9
12	IBT 6	Physical Science	Energy & changes	56.3	77.3
13	IBT 4	Life Science	Living things & life processes	51.1	54.5
15	IBT 8	Life Science	Living things & life processes	42.5	66.8
17	IBT 4	Life Science	Living things & life processes	46.8	40.3
18	IBT 8	Physical Science	Energy & changes	43.7	63.4
20	IBT 6	Life Science	Living things & life processes	40.6	62.9
22	IBT 6	Earth Science	Earth & solar system	38.8	73.7
24	IBT 6	Physical Science	Energy & changes	33.8	68.8
25	IBT 8	Life Science	Living things & life processes	43.6	26.3
26	IBT 6	Earth Science	Earth & solar system	30.8	64.9
27	IBT 8	Life Science	Living things & life processes	32.6	63.5
28	IBT 8	Physical Science	Energy & changes	35.5	53.0
29	IBT 6	Physical Science	Energy &changes	29.3	53.2
30	IBT 8	Life Science	Living things & life processes	35.9	76.2

** The QEM sample was Year 9, and the IBT data were derived from Year 4, 6 & 8 test data.*

INDONESIAN

The aggregated findings of the Indonesian test – for the overall sample as well as separately for each of the three regions, are summarised in Table 4.9. Overall, students correctly answered about 16 of the 30 Indonesian items (SD = 4.4). Test scores ranged from 1 to 30, with little variance across the regions. While the mean test scores show that Java performed better on the test on average, they were not the highest performing regions in terms of the proportion of students correctly answering 25 or more items. This pattern of findings differs to the pattern found for the other three academic tests – where Java performed better than the other regions on all measures (i.e., mean, percent of students correctly answering 5 or fewer/25 or greater). Less than 1 percent of the overall sample correctly answered five or fewer items. This proportion was relatively similar across Java and the West, and slightly higher in the East. The East also had the highest proportion of students correctly answering 25 or more items on the Indonesian test, which was followed by the West and then Java.

Four of the Indonesian test items were answered correctly by more than 70 percent of the sample –items 1, 2, 4 and 15. Three of these items were written to measure writing skills and the fourth to measure reading skills. A further seven items (3, 5, 6, 7, 8, 9 & 17) were correctly

answered by 60 percent or more of students. Two of these were written to assess writing, four for reading skills and one for speaking skills in Indonesia. Interestingly, item 12 (a reading item) was correctly answered by only 2.3 percent of students. The next most difficult item, Item 29 (writing/spelling item), was correctly answered by 27.5 of the sample. See Table 4.10 for data on the other Indonesian language test items.

Table 4.9 Performance on the Indonesian Test

Region	Mean % Correct (SD)	Minimum	Maximum	≤ 5	≥25
Overall	16.2	1	29	0.5	2.7
	(4.4)				
East	15.2	3	27	1.1	2.7
	(4.6)				
Java	16.7	2	29	0.4	1.6
	(4.3)				
West	15.4	1	29	0.6	2.1
	(4.4)				

Table 4.10 Percent Correct for Each Item on the Indonesian Test

Item No	Indonesian	Language Skill Tested	Item No	Indonesian	Language Skill Tested
1	78.4	Writing	16	46.8	Reading (Reference)
2	79.4	Writing	17	69.3	Reading
3	60.0	Reading	18	48.4	Reading
4	75.4	Writing	19	38.9	Reading
5	62.1	Reading	20	47.9	Writing/Speaking
6	65.3	Writing	21	41.1	Speaking/Writing
7	67.2	Speaking	22	45.9	Reading
8	68.4	Reading	23	31.8	Writing
9	65.6	Writing	24	29.0	Writing (Vocabulary)
10	59.5	Writing	25	35.6	Writing
11	54.3	Writing	26	43.4	Writing
12	2.3	Reading	27	28.0	Reading
13	45.4	Speaking	28	37.5	Reading (Vocabulary)
14	55.1	Reading (Grammar)	29	27.5	Writing (Spelling)
15	87.0	Reading	30	32.7	Reading

ENGLISH

The aggregated findings for the English test are detailed in Table 4.11. Overall, students correctly answered about 17 of the 30 English items (SD = 6). The range of test scores was from 2 to 30, with very little variance across the regions. On average, Java performed better on the English test than students from the other two regions, and those from the West performed slightly better than those from the East. The West had the highest proportion of students scoring five or fewer on the English test (6.1%), while Java had the lowest proportion (1.8%). The West had the lowest proportion of students scoring 25 or fewer items (9.3), and Java had the highest (12.8%).

Table 4.11 Performance on the English Test

Region	Mean % Correct (SD)	Minimum	Maximum	≤ 5	≥25
Overall	17.2	2	30	2.4	11.4
	(6.0)				
East	14.8	2	30	4.9	8.5
	(6.3)				
Java	18.1	2	30	1.8	12.8
	(5.7)				
West	15.8	3	30	6.1	9.3
	(6.2)				

There were four items in the English test answered correctly by more than 70 percent of students. Item 4 was correctly answered by only 10.7 percent of the sample, and item 26 by 24.5 percent of the sample (see Table 4.12). No details are provided about domains for the English assessment as the test measured reading comprehension only.

Table 4.12 Percent Correct for Each Item on the English Test

Item No	English	Item No	English	Item No	English
1	57.8	11	67.7	21	64.4
2	48.1	12	74.9	22	43.8
3	63.9	13	53.5	23	71.4
4	10.7	14	49.7	24	52.7
5	74.4	15	47.7	25	56.8
6	65.0	16	43.5	26	24.5
7	45.5	17	56.2	27	64.6
8	56.4	18	28.1	28	51.1
9	51.5	19	31.9	29	55.0
10	83.4	20	69.6	30	77.0

As detailed in the Methodology chapter, the CEFLA is a new testing program developed by ACER, linked to the Common European Framework of Reference for Languages (CEFR). At the time of writing this report, the only data available to use as a means of comparison was that collected in the Czech Republic in April 2009 (n = 2,300 secondary school students). The proportions correct for the students in the QEM study on each item on the CEFLA test was compared to the proportions correct in the Czech Republic sample. The findings from these analyses are provided in Table 4.13. The comparisons are made for interest and completeness only, as test administration was different between the two samples. That is, the test was written completely in English for the Czech sample, which also undertook other components of the CEFLA. The QEM sample, on the other hand, had scene setting information provided to them in Indonesian and completed the reading comprehension component of the test only.

Given the Government of Indonesia's stance regarding the importance of reading and writing in English (and Indonesian), possible future iterations of the current study would ideally test student ability in writing as well. Other domains of English language ability, such as knowledge of grammar and speaking, might also be considered in future studies in the area.

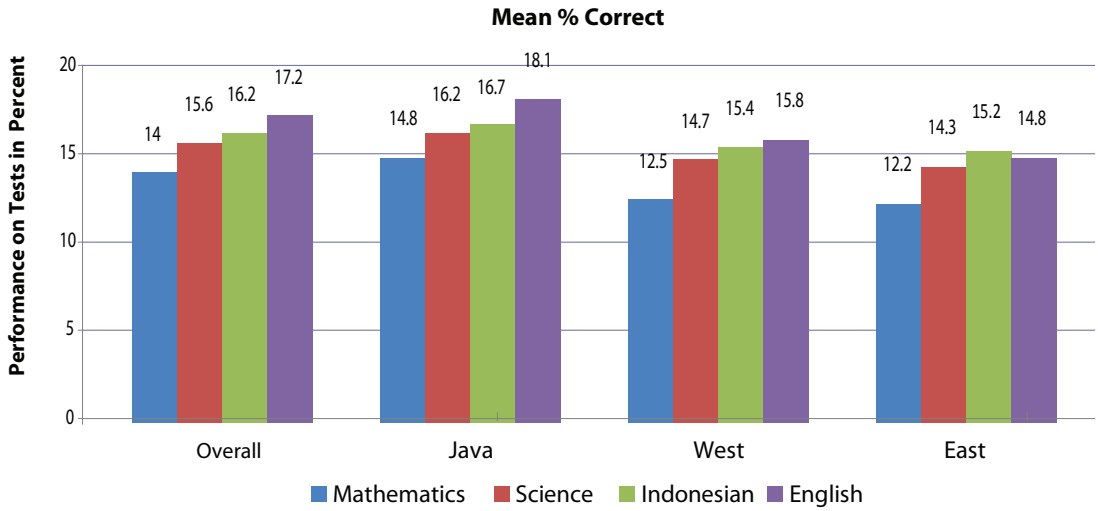
Table 4.13 Comparison of Percent Correct for QEM and CEFLA English Data

QEM Item No	CEFLA Version	QEM Data	Czech CEFLA Data	Diff
1	A1	57.8	64.1	6.3
2	A1	48.1	50.4	2.3
3	A1	63.9	55.7	-8.2
4	A1	10.7	44.2	33.5
5	A1	74.4	55.1	-19.3
6	A1	65.0	87.6	22.6
7	A1	45.5	87.6	42.1
8	A1	56.4	91.7	35.3
9	A1	51.5	67.9	16.4
10	A1	83.4	86.9	3.5
11	A1	67.7	53.1	-14.6
12	A1	74.9	65.7	-9.2
13	A1	53.5	88.4	34.9
14	A1	49.7	41.5	-8.2
15	A2	47.7	56.5	8.8
16	A2	43.5	45.7	2.2
17	A1	56.2	75.9	19.7
18	A1	28.1	70.4	42.3
19	A1	31.9	54.7	22.8
20	A1	69.6	86.3	16.7
21	A1	64.4	72.3	7.9
22	A1	43.8	82.6	38.8
23	A2	71.4	76.1	4.7
24	A2	52.7	37.8	-14.9
25	A2	56.8	32.5	-24.3
26	A2	24.5	36.6	12.1
27	A2	64.6	53.4	-11.2
28	A2	51.1	54.7	3.6
29	A2	55.0	57.0	2.0
30	A2	77.0	60.6	-16.4

ITEM-ANALYSES FOR THE THREE REGIONS

An item-analysis was conducted for each of the four academic tests to assess the proportion of students overall and then within each of the three regions who correctly answered each item. The findings from these analyses are attached as Appendix B.

Figure 4.1 Performance Within Each Region on the Mathematics, Science, Indonesia and English Tests



SUMMARY

This chapter detailed the findings from the four achievement tests administered on students: Mathematics, Science, Indonesian and English. Some of the major findings from those data are as follows:

- » On average, students were able to answer approximately half of the items on any given test. The ranges varied though – from 1 item correct to all 30 items correct.
- » Although there were some regional differences in achievement, they were not significant. These non-significant differences were:
  - Java performed slightly better than the East and the West on each of the academic tests.
  - The West performed marginally better than the East on all four tests.
- » There was no evidence of differences across the Mathematics and Science test domains.
- » Compared to all students that sat TIMSS and all Indonesian students that sat TIMSS, a smaller proportion of students in the QEM sample correctly answered 9 out of the 11 TIMSS Mathematics and 10 of the 14 TIMSS Science items.
- » On the English test, there was no evidence of difference between the performance of students in the QEM sample and the international comparison sample of English as a Foreign Language (EFL) students in the Czech Republic.

► Photo: Marbawi

5 ATTITUDES TO SCHOOL LIFE

5. ATTITUDES TO SCHOOL LIFE

This section details the findings of the School Life Questionnaire (SLQ). Students' perceptions are detailed, both for the sample as a whole and by region. Factors correlated with those perceptions are then detailed, followed by an analysis by gender. Correlations between the SLQ and school variables are provided in Chapter 6. Correlations between the SLQ and student achievement on the academic tests are detailed in Chapter 10.

PERCEPTIONS OF SCHOOL LIFE ACROSS THE SAMPLE

A summary of responses to the SLQ for the sample overall is presented in Table 5.1. The table shows the percentage of students who either 'agreed' or 'strongly agreed' with each statement, along with the mean of ratings given by all students on the 4-point scale. On that scale, 1 indicated that the student strongly disagreed with the statement, while 4 meant the student strongly agreed. Therefore, the higher the mean rating (i.e., the closer it is to 4), the stronger the level of students' agreement with the statement. On the contrary, the lower the mean rating (i.e., the closer it is to 1), the stronger the level of disagreement with the statement. To aid interpretation, the table lists items in descending order of agreement (i.e., not in the order items appear in the instrument).

Overall agreement across the 35 positively-framed items was 75.6 percent. Table 5.1 shows that most of these items received agreement from over 80 percent of students. The five items with the highest agreement score, all above 96 percent and with mean ratings at or above 3.6, share a common theme. They all refer to the relevance of school to students' life. This finding is contrary to the findings reported in a recent Australia Indonesia Partnership report, 'Aspirations and destinations: Senior secondary school graduates in Eastern Indonesia pre- and post-graduation' (May, 2010), which showed that students from both MoRA and MoNE

senior secondary institutions did not feel prepared for higher education or employment. This difference might be related to the different ages and year levels of the students in the two samples. For example, junior secondary school Year 9 students might be optimistic about their future or not be fully aware of the requirements of tertiary study/employment. Whereas, senior secondary school Year 12 students may have greater levels of maturity and understanding about such endeavours. This hypothesis could be investigated in future studies.

The two statements most agreed with – 'the things I am taught are worthwhile learning' and 'the things I learn are important to me' – reflect the value of the content of school lessons. The remaining three highly agreed with items refer to students' futures. Statements that students agreed with at a stronger level than average, refer to the general enjoyment they get from being at school (e.g., 'I feel proud to be a student' and 'I find that learning is a lot of fun'), the support they receive at school from teachers and success (e.g., 'teachers help me to do my best', 'I know I can do well enough to be successful', and 'I am a success as a student').

Over 92 percent of students agreed with the statement 'I get on well with other students in my class', which received a mean rating of 3.3, and 93 percent of students agreed that their school is a place where they feel 'it is easy to get to know other people' (mean = 3.2). However, two statements that revolve around the social aspect of school life received somewhat lower agreement levels. The statements 'I learn to get along with other people' and 'other students are very friendly' received mean ratings of 3, and about 80 percent of students agreed with them.

Approximately one-third of the positively-framed items received 80 percent or less agreement from students and average ratings of less than 3. As mentioned above, a high percentage of students agreed strongly with more general statements suggesting that they perceive the learning process at their school as enjoyable and the work they do as important. However, more specific statements that refer to their engagement with school work received lower ratings. For example, the statements 'I am given the chance to do work that really interests me' and 'I really get involved in my school work', received mean ratings of about 3, with 16.6 and 22.7 percent of students disagreeing with these statements, respectively.

Positively-framed statements that received the lowest agreement ratings also share a common theme. These statements revolved around students' attitudes towards how they are regarded in the school as individuals. About 72 percent of students feel important in their school, and between 64 and 69 percent agreed that school is a place where they are 'treated with respect by other students', where 'people look up [to them]', and where they know that 'people think a lot of [them]'. The mean ratings for these statements were all below 3. Even lower were agreement ratings for statements that refer to the way students feel others regard their thoughts and individual attention they receive from teachers. Over 40 percent of students disagreed with the statements my school is a place 'where teachers listen to what I say' and 'where other people care what I think'. Over 45 percent disagreed that at their school 'teachers take a personal interest in helping [them] with their school work'. The five negatively-framed statements received about 10 percent agreement from students, with means below 2. These items are clustered around the bottom of Table 5.1.

Table 5.1 SLQ Summary Statistics

Statement (My school is a place where...)	% Agreement	Mean Rating	SD
The things I am taught are worthwhile learning	98.8	3.7	0.6
The things I learn are important to me	98.8	3.7	0.6
The things I learn will help me in my adult life	96.7	3.6	0.5
The work I do is good preparation for my future	96.7	3.6	0.7
I have acquired skills that will be of use to me when I leave school	96.7	3.6	0.7
I feel proud to be a student	97.3	3.5	0.6
I find that learning is a lot of fun	96.4	3.5	0.7
I like learning	96.4	3.5	0.6
Teachers treat me fairly in class	99.4	3.3	0.7
I am a success as a student	95.3	3.4	0.8
Teachers help me to do my best	90.8	3.5	0.7
Teachers give me the marks I deserve	92.0	3.3	0.7
I know I can do well enough to be successful	91.3	3.3	0.6
I get on well with the other students in my class	92.6	3.3	0.6
I feel it's easy to get to know other people	93.2	3.2	0.7
Teachers are fair and just	88.7	3.2	0.9
I always achieve a satisfactory standard in my work	89.6	3.2	0.8
I really like to go each day	88.6	3.2	0.8
I feel proud of myself	87.6	3.2	0.7
Other students accept me as I am	87.9	3.1	0.6
I have learnt to work hard	86.2	3.2	0.7
I know how to cope with the work	87.1	3.1	0.6
I am given the chance to do work that really interests me	83.4	3.1	0.7
I get enjoyment from being there	83.2	3.0	0.7
Mixing with other people helps me to understand myself	80.9	3.0	0.7
I learn to get along with other people	80.1	2.3	0.7
Other students are very friendly	78.7	3	0.5
I really get involved in my school work	77.3	2.9	0.7
I feel important	71.9	2.9	0.7
I am treated with respect by other students	68.2	2.8	0.6
People look up to me	66.9	2.8	0.7
I know people think a lot of me	64.8	2.7	0.8
Teachers listen to what I say	58.9	2.6	0.7
Other people care what I think	56.9	2.6	0.6
Teachers take a personal interest in helping me with my school work	53.5	2.6	0.7
I feel worried	12.9	1.8	0.6
I feel depressed	11.9	1.8	0.7
I get upset	9.2	1.6	0.6
I feel restless	8.5	1.7	0.6
I feel lonely	8.2	1.6	0.9

Table 5.2 Attitudes to School Life, by Region

Statement (My school is a place where...)	East	Java	West
The things I am taught are worthwhile learning	3.7	3.7	3.77
The things I learn are important to me	3.6	3.7	3.77
The things I learn will help me in my adult life	3.7	3.6	3.7
The work I do is good preparation for my future	3.6	3.6	3.6
I have acquired skills that will be of use to me when I leave school	3.6	3.6	3.6
I find that learning is a lot of fun	3.6	3.5	3.6
I feel proud to be a student	3.5	3.5	3.5
I like learning	3.5	3.5	3.5
Teachers help me to do my best	3.4	3.5	3.4
I am a success as a student	3.5	3.3	3.4
I know I can do well enough to be successful	3.4	3.3	3.4
Teachers give me the marks I deserve	3.4	3.3	3.4
Teachers treat me fairly in class	3.4	3.3	3.4
I get on well with the other students in my class	3.3	3.2	3.3
I feel it is easy to get to know other people	3.3	3.2	3.3
Teachers are fair and just	3.4	3.2	3.3
I really like to go each day	3.3	3.2	3.3
I always achieve a satisfactory standard in my work	3.2	3.2	3.2
I feel proud of myself	3.2	3.1	3.2
I have learnt to work hard	3.2	3.1	3.2
Other students accept me as I am	3.2	3.1	3.2
I am given the chance to do work that really interests me	3.1	3.1	3.2
I know how to cope with the work	3.1	3.1	3.1
Mixing with other people helps me to understand myself	3.1	3.0	3.1
I get enjoyment from being there	3.1	3.0	3.0
I learn to get along with other people	3.0	3.0	3.1
Other students are very friendly	3.0	2.9	3.0
I really get involved in my school work	3.1	2.9	2.9
I feel important	3.0	2.8	2.9
I am treated with respect by other students	2.8	2.8	2.9
People look up to me	2.8	2.8	2.8
I know people think a lot of me	2.7	2.7	2.7
Other people care what I think	2.6	2.6	2.7
Teachers listen to what I say	2.5	2.6	2.6
Teachers take a personal interest in helping me with my school work	2.4	2.6	2.6
SLQ Score (mean of positively-framed items)	***3.2***	***3.2***	***3.2***
I feel worried	1.8	1.8	1.84
I feel depressed	1.9	1.8	1.80
I feel restless	1.7	1.8	1.70
I feel lonely	1.7	1.6	1.69
I get upset	1.5	1.6	1.61

PERCEPTIONS OF SCHOOL LIFE ACROSS THE REGIONS

Table 5.2 provides the mean ratings given to each of the items on the SLQ within each of the three regions. The items are presented in the same order of agreement as they were in Table 5.1 which detailed the overall findings. On average, students in all three regions had an overall SLQ score of 3.2, which means that students generally hold a positive perception about their schooling experience.

Students in Java gave slightly lower agreement ratings to 27 of the 35 positively-framed items. However, most of these differences were 0.10 or less. The most notable differences between the three regions was for the items 'teachers are fair and just' and 'I feel important', where the average difference between students in Java and students in the East was 0.2 points. Students in the West reported similar attitudes to their Javanese counterparts (e.g., 3.20 & 3.25; 2.83 & 2.86).

FACTORS CORRELATING WITH ATTITUDES TO SCHOOL LIFE

Correlation analyses were conducted to assess the existence of any relationship between positive and negative attitudes to school life and student and school background factors. Pearson correlations were computed for the student background variables and the categorical school variables, and Spearman correlation coefficients were used for the continuous school variables.

Student Background Factors

The correlation coefficients between student background factors and attitudes to school life were small (less than 0.1). Therefore, for ease of reading only those factors with correlation coefficients greater than 0.06 or twice the associated standard error of 0.03 are reported in Table 5.3. This table shows that number of study materials has a positive correlation with the positive SLQ score and a negative correlation with the mean of Negative item ratings. This finding suggests that students who have access to more study materials (e.g., stationery, calculator, school bag, textbooks) have a more positive attitude to school and a lower negative attitude to school. Further, students with access to individual textbooks also have more positive attitudes to school life.

Table 5.3 Student Background Factors and Attitude to School Life Correlations

	SLQ Score	Negative Score
Number of study materials available to student (all)	.080	-.081
Study materials – English textbook	.077	-.062
Study materials – Islamic textbook	.064	-.040
Study materials –Indonesian textbook	.067	-.061
Freq. teacher checks homework – Mathematics	.064	-.013
Freq. teacher checks homework – Science	.093	-.040
Freq. teacher checks homework –Indonesian	.061	-.062
Freq. teacher checks homework – English	.070	-.048

Table 5.4 Student Background Factors and Attitude to School Life Correlations, by Region

	Region	SLQ Score	Negative Score
Number of study materials available to student	Java	.108	-.069
	West	.063	-.074
	East	.021	-.147
Freq. teacher checks homework – Mathematics	Java	.052	-.001
	West	.100	-.006
	East	.022	-.086
Freq. teacher checks homework – Science	Java	.081	-.045
	West	.151	-.001
	East	.039	-.076
Freq. teacher checks homework –Indonesian	Java	.098	-.076
	West	.036	-.025
	East	.011	-.075
Freq. teacher checks homework – English	Java	.059	-.035
	West	.075	-.044
	East	.098	-.129

The frequency that teachers check students' homework was also found to be correlated with students' attitude towards school life. The scores are higher for students who find that teachers check their homework more often (a score of 1 means students are not given homework for that subject, 2 means that teachers never check their homework, and 5 means teachers always checks their homework). This suggests that students whose teachers are most involved in their schoolwork have a more positive attitude toward school.

Correlations were then calculated for those variables listed in Table 5.3 for each of the three regions. Table 5.4 shows the findings from these analyses. Each of the correlations was important across each of the regions – albeit they were stronger in some regions than in others. Notably stronger correlations exist between Javanese students' positive attitude to school life and the number of study materials that are available to them. In the West, there are stronger correlations between attitude to school and the frequency with which Mathematics and Science homework are checked, although the inverse correlation was not found with negative school life score. In the East, there are correlations between the frequency that teachers check English homework and both students' SLQ score and negative score. Students whose English homework is checked more frequently have higher positive SLQ scores, and those whose English homework are seldom checked have higher negative SLQ score.

GENDER DIFFERENCES IN ASPECTS OF ATTITUDES TO SCHOOL LIFE

As gender differences in attitudes to school life was identified as important by stakeholders involved in this project, this sub-section examines gender differences in three aspects of attitudes to school life which were shown above to have significant differences to the mean scores. These aspects are students' perceptions of the relevance of school content to their future, perception of the status others afford them as an individual, and negative attitudes to school life.

Table 5.5 Selected Aspects of Attitudes to School Life, by Gender

	% Agreement		Mean Rating	
	Boys	Girls	Boys	Girls
The things I am taught are worthwhile learning	98.6	99.2	3.69	3.76
The things I learn are important to me	98.5	99.0	3.63	3.68
The things I learn will help me in my adult life	96.4	96.9	3.62	3.66
I have acquired skills that will be of use to me when I leave school	96.3	97.0	3.59	3.61
The work I do is good preparation for my future	96.8	96.8	3.61	3.63
I know people think a lot of me	67.5	62.3	2.74	2.68
Teachers listen to what I say	61.8	55.8	2.62	2.52
I am treated with respect by other students	70.9	66.1	2.84	2.77
Other people care what I think	58.4	55.9	2.62	2.58
Teachers take a personal interest in helping me with my school work	55.7	51.2	2.61	2.51
People look up to me	67.8	66.4	2.78	2.76
I feel worried	12.4	13.0	1.84	1.81
I feel depressed	12.6	10.0	1.85	1.74
I get upset	9.8	8.4	1.62	1.58
I feel restless	8.9	7.9	1.76	1.71
I feel lonely	8.1	8.0	1.64	1.61

As Table 5.5 illustrates, most of the gender differences in responses to the above items are not statistically significant. The pattern of the small differences across the three aspects is, however, consistent. More girls agreed with statements about the importance of what they learn at school and its relevance to their future than boys. However, boys are more likely to agree with statements about individual attention and status given to them by others at school than girls. Boys are also more likely to agree with the negative statements than girls, except for the statement "I feel worried". These findings are interesting and future research might further investigate these differences.

SUMMARY

This section discussed MTs students' attitudes to school life as measured by the SLQ. Findings from the results included:

- On average, the 35 positively-framed statements in the SLQ received an agreement rating of 3.17 (SD=0.1) from all students, on a scale of 1 to 4, with 4 being 'Strongly agreed'.
- Statements that received the strongest agreement from students were those that deal with students' views on the importance of the things they learn at school and the relevance of these to their future. Over 96 percent of students agreed with five statements that discuss this issue, and all of these statements received agreement ratings of over 3.6.
- Of the positively-worded statements, those that received the lowest agreement from students were those that cover students' views on the way their thoughts are valued by others in the school; or the respect and status they are afforded by others in the school. Over 30 percent of students disagreed with the six statements that touch upon this topic, and these statements received overall agreement ratings of below 2.8.

- Overall, there was little regional difference in student attitudes to school life. However, students in the Java showed slightly lower agreement and students in the East slightly higher agreement with the most positively-framed statements.
- Atypically, however, students in the East showed significantly lower agreement rates with statements that refer to the individual attention they receive from teachers, such as 'my school is a place where teachers listen to what I say' (0.08 lower than the overall average) and 'my school is a place where teachers take a personal interest in helping me with my school work' (0.12 points lower).
- Of the elements in the student background questionnaire, only access to study materials – textbooks specifically – and the frequency in which teachers check their homework were found to be correlated with students' attitudes to school life.
- Students with access to more study materials and those with Mathematics, Science, Indonesian and English textbooks had a stronger positive attitude to school life.
- Students whose teachers check their homework – particularly for Science – tended to have a stronger positive attitude to school life.
- Overall, there was little gender difference in attitudes to school life. However, girls are slightly more positive than boys towards the importance of what they study at school and its relevance to their future.
- Boys have a slightly more positive attitude than girls towards the attention given to their thoughts and status afforded to them by others in the school. However, boys also tended to agree more with the negatively-framed statements than girls.

► Photo: M Wildan

6 MADRASAH CHARACTERISTICS, STAFFING AND PROCESSES

6. MADRASAH CHARACTERISTICS, STAFFING AND PROCESSES

This chapter presents descriptions of the general characteristics of MTs, staffing, administration and management processes. The information was collected through the principal interviews and is presented for the whole sample and for each of the three regions. Where relevant, correlations between different characteristics are also discussed. Information on the relationship between these variables and achievement is provided in Chapter 8.

LOCATION

According to the Bureau of Statistics (Badan Pusat Statistik / BPS) classification, of the 150 sampled MTs, almost 90 percent were located in Kabupaten (towns) and just over 10 percent in Kota (cities). Following principals' classification during interviews, only eight percent of MTs were located in or near a large town or city. As shown in Table 6.1, over half were located in rural areas/villages and approximately 20 percent are located in or near a small town. Almost five percent of participating MTs were in remote locations.

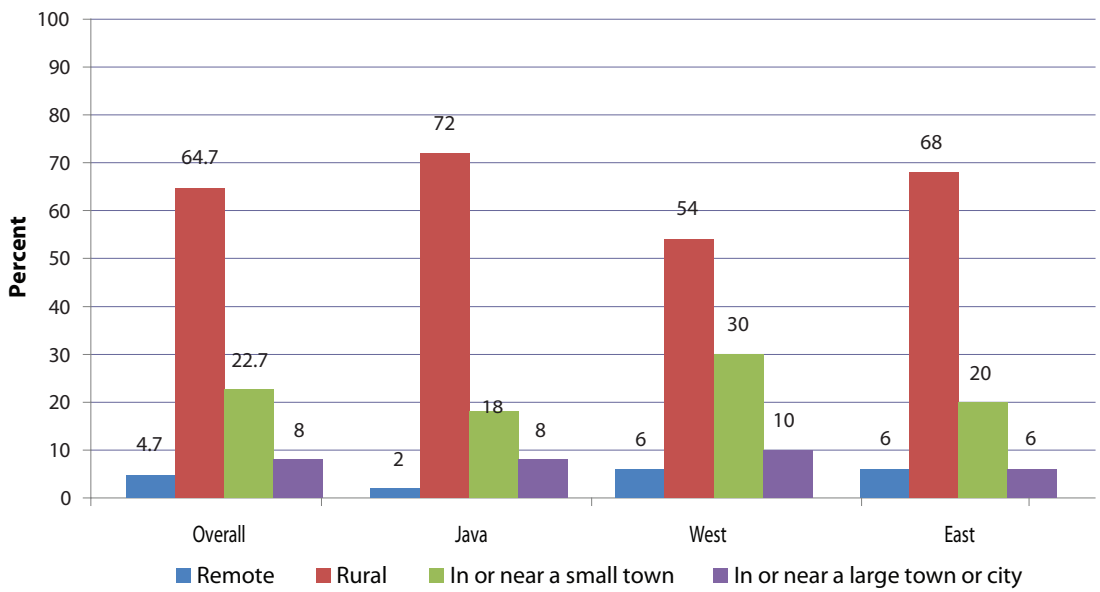
The distribution of MTs by region only varied slightly and the differences were not statistically significant. In Java, there were fewer MTs in remote areas and more in rural areas. In the West, there were more MTs in or near small towns and less in or near towns. School location was significantly correlated with school type at the national level, with there being more public schools in more urban areas. This correlation was also reflected in analyses of the Java and West regions.

Table 6.1 Location of MTs, by Region

	Overall	Java	West	East
School location				
Remote	4.7	2.0	6.0	6.0
Rural	64.7	72.0	54.0	68.0
In or near a small town	22.7	18.0	30.0	20.0
In or near a large town or city	8.0	8.0	10.0	6.0
Distance to services				
Nearest health centre/clinic				
Range	<1-35	1-10	<1-35	<1-25
Mean	2.73	2.44	2.45	3.30
Nearest book shop				
Range	<1-230	1-60	<1-90	<1-230
Mean	22.48	*12.51	22.48	32.67
Nearest shopping centre				
Range	<1-235	1-80	<1-235	1-230
Mean	34.91	*19.43	39,87	48.07
Nearest market				
Range	<1-50	0-10	<1-50	<1-18
Mean	4.49	*3.14	6.40	3.92

**difference with national mean is significant at the 0.05 level*

Figure 6.1 Location of MTs, by Region



Principals were also asked the approximate distance between their MT and important facilities and services: health centre/clinic, book shop, shopping centre and market place (see Table 6.1). Overall, MTs were quite far from bookshops and shopping centres but closer to health centres and markets. Java MTs had a significant tendency to be closer to a bookshop, a shopping centre and a market than schools in other regions.

An examination of the distance to facilities and services and MTs location found that the only statistically significant relationship was between madrasah location and distance to the nearest health centre/clinic. The correlation was small but it shows that the more remote MTs were more likely to be located closer to a health centre or clinic. This may be because community health centres (puskesmas) are included in the definition, and in rural areas they tend to be located near schools.

ENROLMENT

Student Demographics

Details about students at MTs are provided in Table 6.2. Enrolment of MTs overall was 184 students on average. Almost 40 percent of MTs had a total student enrolment size of 100 or less. Another 55 percent had more than 100 but less than 500 students, and a small group (around 6%) had over 500 students. An MTs in the East region had a considerably larger enrolment size of over 1,000 students. Differences in school enrolment size between the three regions were not statistically significant.

Table 6.2 Student Enrolment at MTs, by Region

	Overall	Java	West	East
Whole School				
Enrolment				
Range (students)	19-1,062	19-753	25-650	31-1,062
Mean (students)	184.0	117.2	211.4	162.3
Girls (%)	51.5	53.5	49.9*	51.5
Boys (%)	48.1	46.5	49.2*	48.4
Number of class groups				
Range	1-25	1-19	3-21	1-25
Mean	5.7	6.2	5.6	5.4
Year 9				
Enrolment				
Range (students)	3-334	15-200	4-262	3-334
Mean (students)	57.0	68.2	53.4	49.4
Girls (%)	51.6	50.0	53.9	52.7
Boys (%)	48.4	50.0	46.1	47.8
Number of class groups				
Range	1-8	1-7	3-21	1-25
Mean	1.9	2.0	5.6	5.4
Class size				
Range	2-70	6-59	4-61	2-70
Mean	32.2	33.9	32.5	30.3

** Gender breakdown data was not collected from one school*

Enrolment size was found to be significantly correlated with school location, SES status and school type. There is a small but significant correlation between enrolment size and location, with MTs in more urban areas having more students. There is a stronger positive correlation

between MT enrolment size and its position on the school resources scale as well. The correlation between enrolment size and school type was also strong and statistically significant, with public MTs being on average considerably larger in enrolment size (Mean=425.5, SD= 215.5) than private MTs (Mean=153.1, SD=120.3).

There were no gender differences in student enrolment, overall or within regions. This proportion also holds nationally when only Year 9 students are looked at. Only two MTs in the sample were single-sex schools. One was an all male school in a remote area and the other, an all female school in a small town, located in different provinces in the East region. A great majority of MTs (over 90 percent) operate only one session per day, while the rest divide these class groups into two school sessions a day, most commonly a morning and an afternoon session.

The average number of class groups overall was 5.7, with a range between 1 and 25 class groups. The average number of class groups in the Year 9 level is close to 2, ranging from 1 to 8 groups. Overall, average class size in MTs was approximately 32 students. There was quite a large range of class sizes however, from classes with less than 10 students to classes with more than 60 students. Again, differences in class sizes across regions were not statistically significant.

Monitoring of Student Attendance

Principals were asked how they monitor student attendance, and these responses are summarised in Table 6.3. Almost all MTs record student attendance during every class, and most record student attendance every morning. MTs in the East region, however, record student attendance at a statistically significant lower rate than other regions. Fewer MTs in the East region ask students to report their absences to school. Around one-fifth of principals put forward 'other' methods practiced in their school to monitor student attendance. However, most of these were variations of the practices already on offer, such as subject teachers recording student attendance or student attendance recorded during morning assemblies. Other practices included student attendance being recorded by their homeroom teachers and having a school committee that monitors attendance.

Table 6.3 Student Attendance Monitoring, by Region

	Overall	Java	West	East
Student attendance not recorded	4.0	4.0	4.0	4.0
Student attendance recorded every morning	88.0	94.0	84.0	86.0
Student attendance recorded every class	96.0	98.0	100.0	*90.0
Student reports absences to school	70.7	84.0	76.0	**54.0
Principal personally monitors student attendance	70.0	74.0	62.0	74.0
Teacher on-duty monitors student attendance	67.3	68.0	76.0	58.0
Other	19.3	19.0	18.0	24.0

* *difference with overall mean is significant at the 0.05 level*
** *difference with overall mean is significant at the 0.01 level*

CHARACTERISTICS OF LEADERS

Table 6.4 provides a breakdown of qualifications, experience and teaching responsibilities of MT principals by region. A total of 150 leaders of MTs were interviewed by the field team. In nine MTs the principal was not available to be interviewed, in which case a deputy principal was interviewed. In these instances, the deputy principal was asked to provide information on the absent principal rather than themselves. Therefore, data provided in Table 6.4 refer to characteristics of the principals of the 150 MTs that took part in the study.

Table 6.4 Characteristics of MTs Principals, by Region

	Overall	Java	West	East
Age				
Range (in years)	24 -73	27-65	24-73	28-67
Mean (years)	44.4	44.8	42.5	44.8
Gender (%)				
Female	9.2	8.3	10.4	8.9
Male	90.8	91.7	89.6	91.1
Qualification (%)				
Primary education	.7	-	2.0	-
Junior secondary education	.7	2.0	-	-
Senior secondary education	6.0	4.0	12.0	2.0
Two-year diploma (D2)	4.0	2.0	2.0	8.0
Three-year diploma (D3)	5.3	8.0	6.0	2.0
Undergraduate degree (S1)	73.3	70.0	70.0	80.0
Masters degree (S2)	9.3	14.0	8.0	6.0
Doctoral degree (S3)	.7	-	-	2.0
Specialised training in school management				
Yes (%)	58.7	64.0	48.0	64.0
Duration (in weeks)				
Range	1-15	1-8	1-13	1-15
Mean	1.2	1.1	1.0	1.5
Teaching experience (years)				
Range	<1-45	<1-45	<1-45	<1-42
Mean	16.8	17.9	15.2	17.4
Total years as principal				
Range	<1-28	<1-23	<1-28	<1-25
Mean	7.4	7.8	7.2	7.2
Years as principal at current school				
Range	<1-35	<1-23	<1-23	<1-35
Mean	6.5	6.5	6.4	6.6
Currently teaches at school				
Yes (%)	88.7	84.0	90.0	92.0
Number of lessons taught per week				
Range	3-34	4-19	3-24	6-34
Mean	9.7	8.9	9.5	10.5

^ *No principal reported having a one-year diploma (D1) as their highest qualification*

Figure 6.2 Characteristics of MTs Principals, by Region

The average age of principals was 44.4 years. The youngest principal was 24 years and the oldest was 73 years. A significant majority of principals are male, with only around one-tenth of principals being female. The age range and gender distribution of principals across regions were similar.

Qualification and Experience

Almost three out of every four MTs principals hold an undergraduate degree and a further one-tenth hold both an undergraduate and a postgraduate degree, as shown in Table 6.4. Close to one-tenth of principals hold a diploma, while six percent of principals have only completed senior secondary schools. Notably, in the West region, 12 percent of principals have only senior secondary qualifications, which is twice as many as the overall mean. It is also the only region where a principal has only completed primary school.

Just fewer than 60 percent of MTs principals have undergone specialised training in school management. On average, they had participated in a total of 1.2 weeks of training, with half having undergone one week of training. Close to 40 percent of principals have attended between 2 and 5 weeks of training and around 2 percent have undergone more than 5 weeks of training.

On average, principals had 16.8 years of teaching experience, with most having between 7 and 27 years of experience. Although overall there is a strong correlation between age and years of teaching experience, the relatively small group (12.7%) of principals that had less than 7 years of teaching experience range from 24 to 66 years old. At the time of interview, the principals had been a principal (either at their current or at previous schools) for an average of 7.4 years. Almost two-thirds had been a principal for eight years and less. The additional third, however, had up to 28 years of experience as a principal. The average number of years MTs principals had been a leader at their current MTs, as either a principal or a deputy principal, was 6.5 years. Four in every five principals had been a leader at their current MTs for 10 years or less. Differences between regions in terms of principal experience were not statistically significant.

Approximately 88 percent of principals also regularly teach classes at their MTs. Those who did taught an average of nine lessons per week. Approximately 10 percent of principals taught 18 lessons or more per week. There was a small but statistically significant negative correlation between the number of lessons a principal teaches a week in their MTs and the number of permanent teachers in that school. Interestingly, there was a stronger and statistically significant positive correlation between principals' teaching responsibilities and the number of years they had been at their current school.

CHARACTERISTICS OF TEACHERS

Demographics

MTs have on average about 21 teachers, with a minimum of 7 and maximum of 61 teachers. The regional difference is not significant and these can be found in Table 6.5. The gender distribution of MTs teachers is also fairly equal. However, in contrast to the finding that there are slightly more female students than male students, the study found that there are slightly more male than female teachers, except for the West region. The difference is most pronounced in Java.

Teacher Employment Status

During interviews, principals were asked to report the number of teachers in their MTs according to their employment status at that school. Responses to this question during the pilot phases had brought to light a common occurrence in madrasahs where honorary teachers at a particular MTs are also employed as permanent teachers in another school. Data collectors

were asked to clarify with principals that the question refers to the teachers' employment status at their school, despite other appointments they may have elsewhere. Inspection of the results found that about 20 percent of teachers have civil servant status (Pegawai Negeri Sipil / PNS), permanent teachers employed by either MoNE or MoRA. The majority are private employees, as either permanent staff employed by the foundation that runs the MTs (52.7 %) or as honorary teachers (27%). Honorary teachers can be employed and receive salary from either the school directly or the foundation that runs the school, and they can work in either private or public schools. A small percentage of teachers are contract teachers.

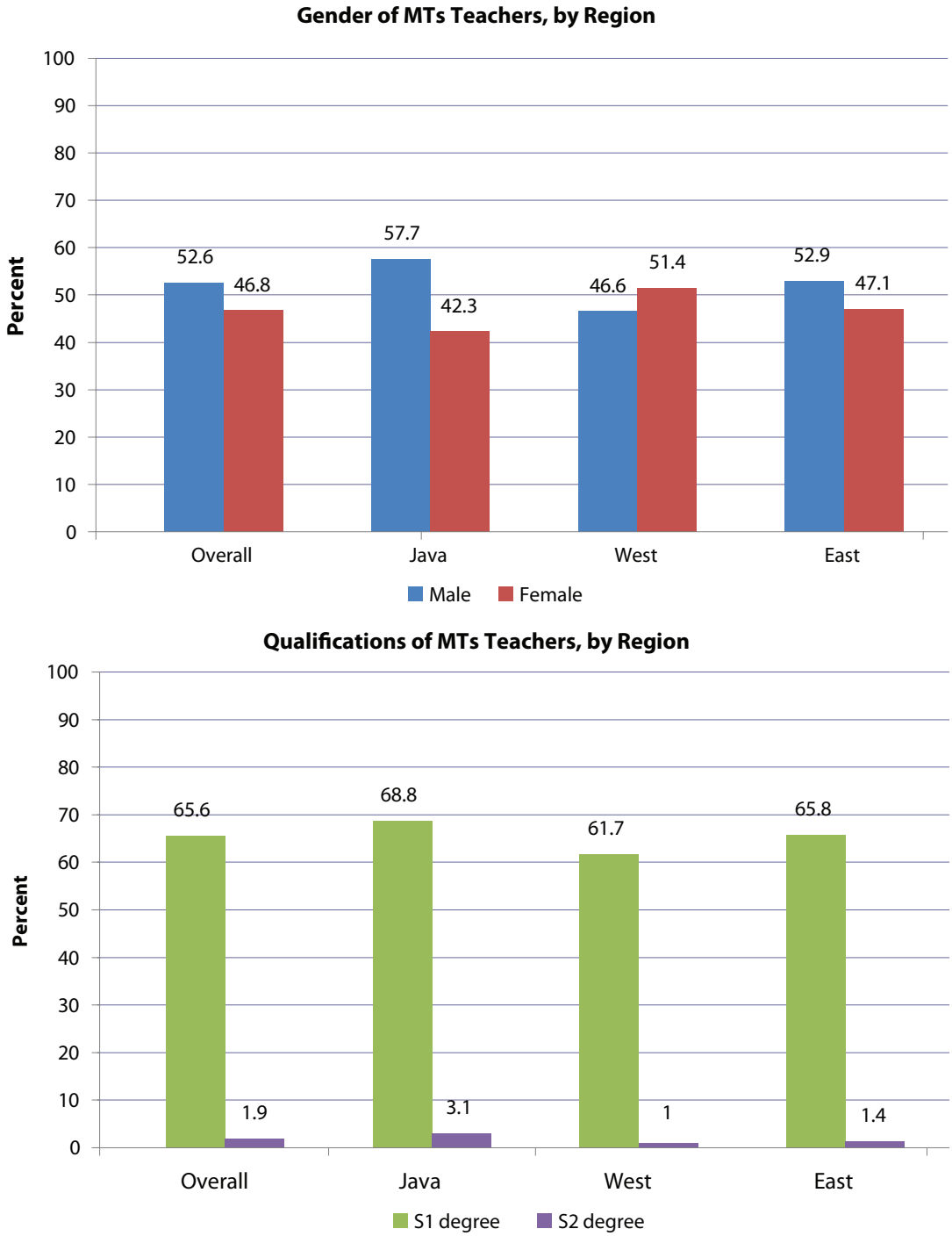
These findings are consistent with the type of schools in the sample, with significantly more private (89%) than public schools, and which in turn reflects the distribution of MTs in Indonesia. A very strong and significant overall correlation was found between school type and proportion of PNS teachers. As public schools tend to be larger in enrolment size, there was also a significant correlation between proportion of PNS teachers and total enrolment size. These correlations hold at the regional level, with the exception of the East, where there is no correlation between proportion of PNS teachers and school location.

Table 6.5 Characteristics of MT Teachers, by Region

	Overall	Java	West	East
Number of teachers				
Range	7-61	11-48	10-49	7-61
Mean	20.7	22.1	19.5	20.6
Gender (%)				
Female	46.8	42.3	51.4	47.1
Male	52.6	57.7	46.6	52.9
Employment Status at School (%)				
Permanent public servant (PNS)	20.3	16.2	18.5	26.3
Permanent foundation teacher	52.7	*39.3	*74.5	46.3
Honorary teacher	27.0	*44.2	*5.2	29.2
Contract teacher	1.8	.3	2.0	3.4
Qualification (%)				
< Secondary education	.7	.7	.2	*1.2
Secondary education	18.2	18.3	22.2	14.4
One-year diploma (D1)	1.1	0.6	2.1	0.6
Two-year diploma (D2)	7.0	*4.4	7.6	9.2
Three-year diploma (D3)	4.1	4.0	5.0	3.3
Undergraduate degree (S1)	65.6	68.8	61.7	65.8
Masters degree (S2)	1.9	*3.1	1.0	1.4
Doctoral degree (S3)	.0	.0	.0	**.1
Certification Status (%) #				
Already certified	12.6	13.5	9.4	14.6
Undertaking workshop	4.6	7.3	1.1	4.9
Preparing portfolio	8.7	11.4	6.4	8.1
Yet to commence certification	52.8	58.0	57.3	43.0

** difference with overall mean is significant at the 0.05 level*
*** difference with overall mean is significant at the 0.01 level*
 # there was a high rate of inconsistency in reported certification status

Figure 6.5 Characteristics of MTs Teachers by Region



There were strong significant correlations between proportion of PNS teachers and proportion of foundation teachers overall and at regional levels, but none between proportion of PNS teachers and proportion of honorary teachers. There is great regional variation between the proportion of foundation teachers and proportion of honorary teachers. In Java, there are slightly more honorary teachers than foundation teachers. In the East, however, the opposite is true. Most notably, in the West, almost 75 percent of all the teachers were employed as permanent foundation teachers and only about 5 percent were honorary teachers.

The proportion of foundation teachers in an MTs is significantly correlated with a number of other factors. There were small but statistically significant correlations between proportion of foundation teachers and school location. In contrast to PNS teacher proportions discussed above, MTs with a higher proportion of foundation teachers tended to be private. Likewise, there was a correlation between high proportions of foundation teachers and more rural schools. MTs with higher proportions of foundation teachers also tended to have smaller proportions of PNS teachers, honorary teachers and contract teachers. Proportion of honorary teachers, on the other hand, was found to be significantly linked only to proportion of foundation teachers, although the correlation was very strong. Schools with higher proportions of honorary teachers were likely to have much lower proportions of foundation teachers.

Qualifications

The most common qualification held by MTs teachers was an undergraduate degree (65.6%). Just over 10 percent of teachers had completed a diploma, most being two-year diplomas. Close to one in every five MTs teachers, however, had only completed secondary education themselves. Very few teachers had doctoral degrees or 'less than secondary education'.

Regional differences in relation to teacher qualifications that were statistically significant are shown in Table 6.5. Java had the highest proportion of teachers with undergraduate and masters degrees, and East had the lowest. In the East there was a significantly lower proportion of teachers who had less than secondary qualifications. Moderately strong and significant correlations were evident between proportion of teachers with an undergraduate degree, school type and school location, with more public schools having higher proportions of such teachers, as did schools in more urban areas.

Principals were also asked to provide the numbers of teachers in their MTs who had commenced teacher certification or who were already certified. Keeping in mind the supposed instances of teachers who teach in more than one school, contrary to the advice given to principals to only take into account teacher employment status in their school, principals were asked to give overall figures of teacher certification status, regardless of which school teachers underwent the certification process. This follows the presumption that the additional knowledge and experience attained during the certification process is retained by individual teachers and therefore impacts their instructional practice wherever they teach.

Unfortunately, this may have contributed to the inaccuracy of data provided by principals regarding certification status of teachers. For data completion, principals were also asked the number of teachers who had not yet commenced the certification process. Analysis of the results found a high rate of instances (38%) where the number of teachers which were reported by principals to be in various certification stages did not add up to the total number of teachers in the school which they had reported earlier. A number of factors in various stages of the research may have contributed to this discrepancy. Future research in the area ought to work toward amending this limitation.

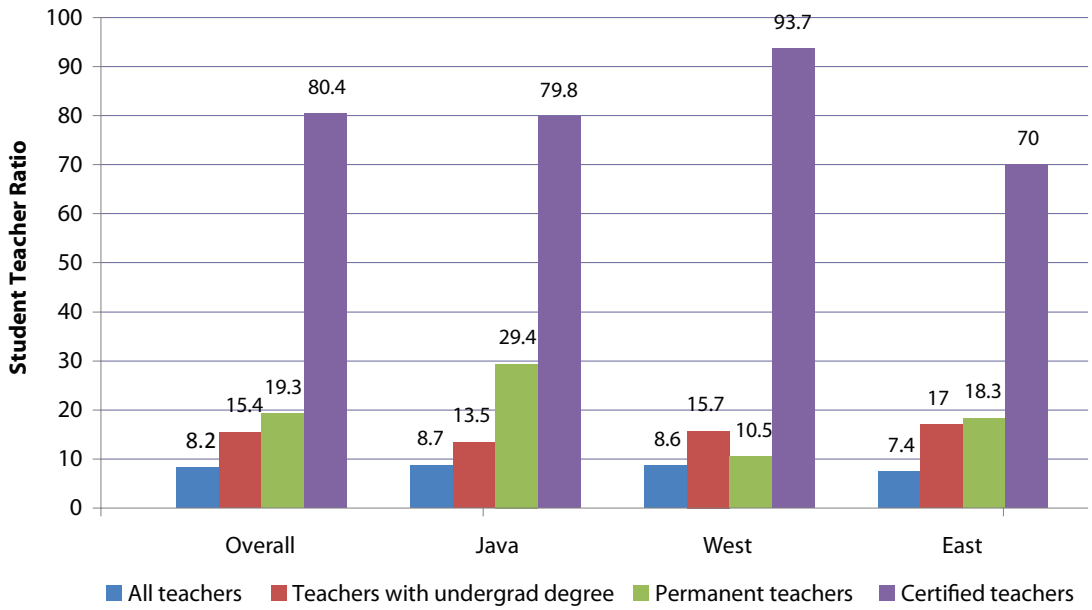
Student to Teacher Ratios

Table 6.6 presents the mean student to teacher ratio in MTs. When all teachers in a school are taken into consideration, the ratio is approximately 8 students to every teacher. The average student to teacher ratio in MTs in the East region is lowest at 7.4, the ratio in the West and in Java are 8.6 and 8.7, respectively. However, the ratio of student to teachers with at least an undergraduate qualification is almost double the earlier figures. This ratio is highest in the East, where there are on average 17 students to every teacher with an undergraduate degree.

Table 6.6 MTs Students to Teacher Ratio, by Region

	Overall	Java	West	East
Ratio of students to:				
All teachers	8.2	8.7	8.6	7.4
Teachers with undergrad degree or over	15.4	13.5	15.7	17.0
Permanent teachers*	19.3	29.4	10.5	18.3
Certified teachers	80.4	79.8	93.7	70.0
**Permanent PNS and Foundation teachers*				

Figure 6.6 MTs Students to Teacher Ratio, by Region



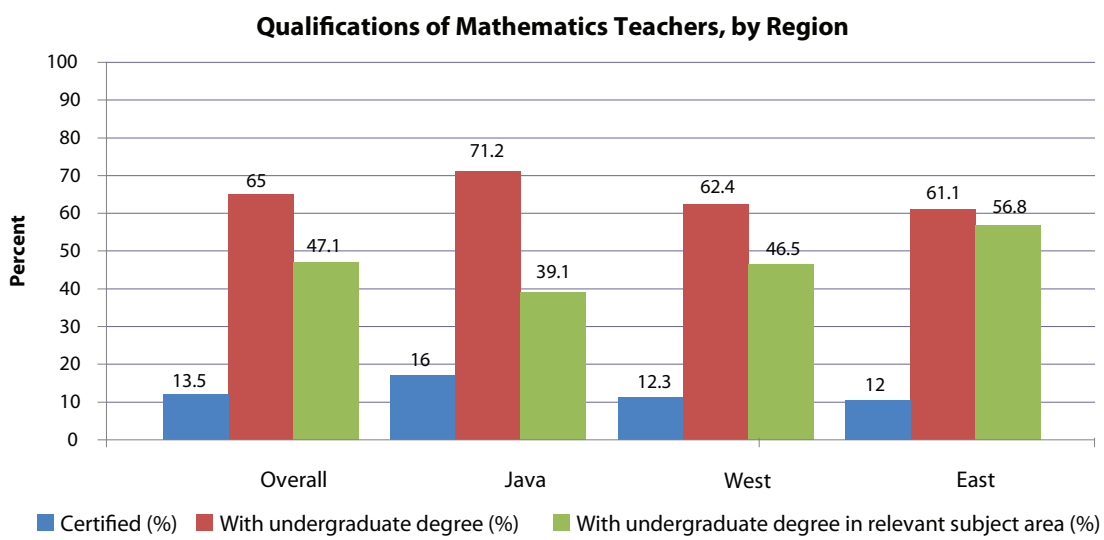
To accurately calculate the ratio of student to full-time teacher requires data on the workload of part-time and contract teachers. As this was not available in the current study, the closest measure available was to examine the ratio of students to permanent full-time teachers, taking into account PNS teachers and permanent foundation teachers. This ratio was around 19 students to every teacher.

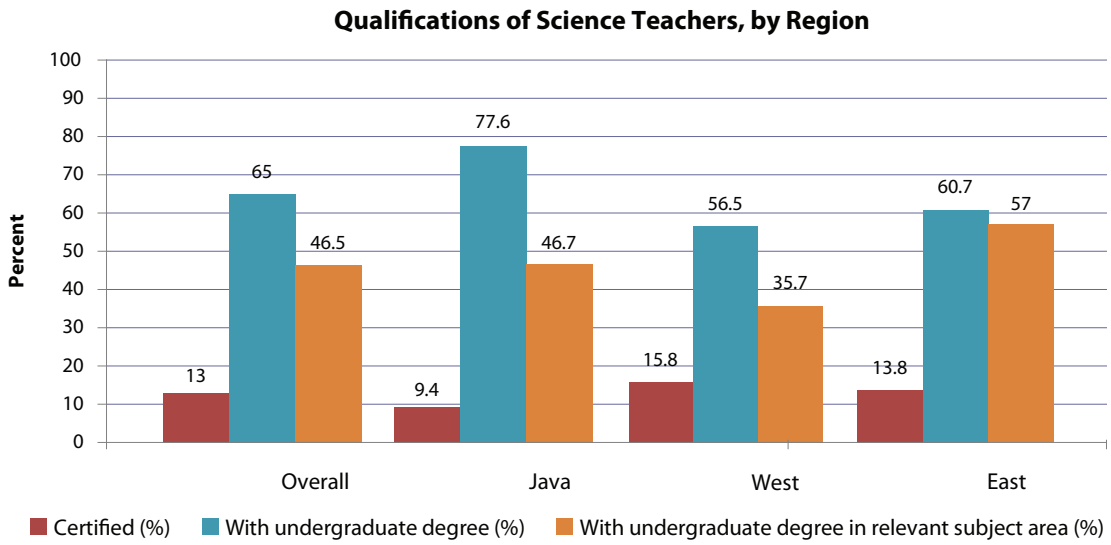
Even higher is the ratio of students to certified teacher. The national average is approximately 80 students to every certified teacher. The mean ratio in the East and Java are respectively around 70 and 80 students to every certified teacher. In the West the mean ratio is even higher at around 94.

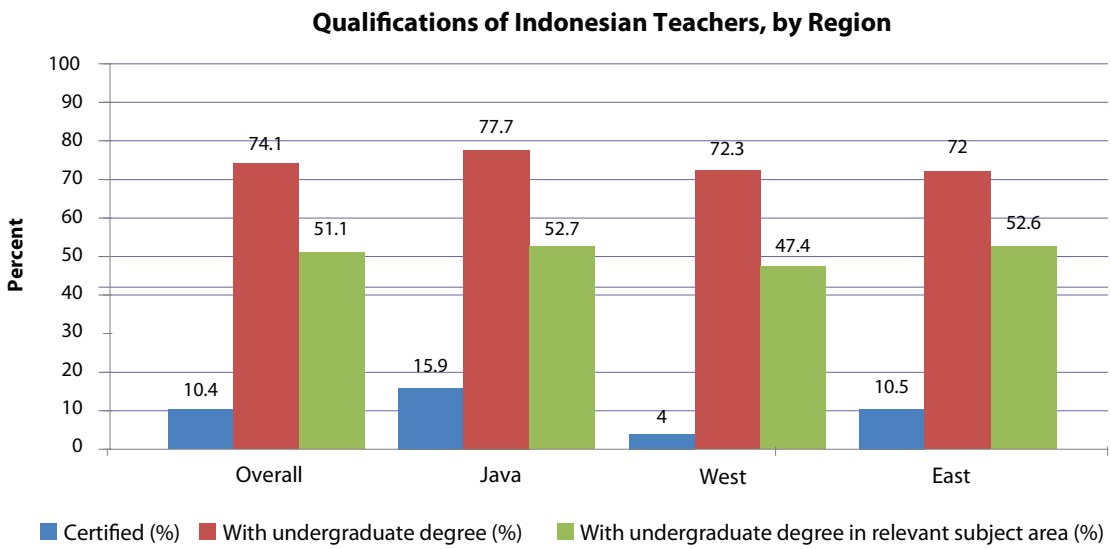
Table 6.7 Qualifications of MTs Teachers in Core Subjects, by Region

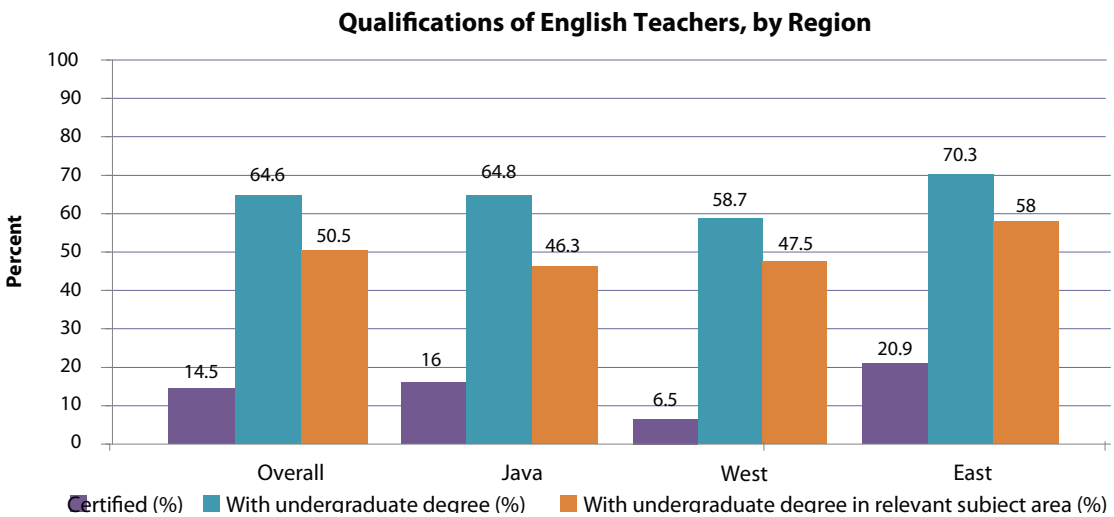
	Overall	Java	West	East
Mathematics teachers				
Number of teachers (per school)				
Range	0-7	1-7	1-5	0-7
Mean	1.9	2.1	1.8	1.8
Certified (%)	13.5	16.0	12.3	12.0
With undergraduate degree (%)	65.0	71.2	62.4	61.1
With undergraduate degree in relevant subject area (%)	47.1	39.1	46.5	56.8
Science teachers				
Number of teachers (per school)				
Range	0-8	1-4	1-5	0-8
Mean	2.0	2.0	2.0	2.1
Certified (%)	13.0	9.4	15.8	13.8
With undergraduate degree (%)	65.0	77.6	56.5	60.7
With undergraduate degree in relevant subject area (%)	46.5	46.7	35.7	57.0
Indonesian teachers				
Number of teachers (per school)				
Range	0-5	1-5	0-5	0-5
Mean	1.7	1.8	1.6	1.7
Certified (%)	10.4	15.9	4.0	10.5
With undergraduate degree (%)	74.1	77.7	72.3	72.0
With undergraduate degree in relevant subject area (%)	51.1	52.7	47.4	52.6
English teachers				
Number of teachers (per school)				
Range	0-6	1-4	1-4	0-6
Mean	1.8	1.8	1.8	1.8
Certified (%)	14.5	16.0	6.2	20.9
With undergraduate degree (%)	64.6	64.8	58.7	70.3
With undergraduate degree in relevant subject area (%)	50.5	46.3	47.5	58.0

Figure 6.7 Qualifications of MTs Teachers in Core Subjects, by Region




Qualifications of Science Teachers, by Region
Percent
100
90
80
70
60
50
40
30
20
10
0
13
65
46.5
9.4
77.6
46.7
15.8
56.5
35.7
13.8
60.7
57
Overall
Java
West
East
Certified (%)
With undergraduate degree (%)
With undergraduate degree in relevant subject area (%)


Qualifications of Indonesian Teachers, by Region
Percent
100
90
80
70
60
50
40
30
20
10
0
10.4
74.1
51.1
15.9
77.7
52.7
4
72.3
47.4
10.5
72
52.6
Overall
Java
West
East
Certified (%)
With undergraduate degree (%)
With undergraduate degree in relevant subject area (%)


Qualifications of English Teachers, by Region
Percent
100
90
80
70
60
50
40
30
20
10
0
14.5
64.6
50.5
16
64.8
46.3
6.5
58.7
47.5
20.9
70.3
58
Overall
Java
West
East
Certified (%)
With undergraduate degree (%)
With undergraduate degree in relevant subject area (%)

Core Subjects

Table 6.7 presents the results from specific questions regarding the qualifications of MTs teachers in the four subject areas that students were tested in: Mathematics, Science, Indonesian, and English. Information was collected on the number of teachers with at least an undergraduate degree and the number with a degree in the curriculum area they are currently teaching in. On average, there were about two teachers in each of the subject areas per MTs. In every subject area, one or two MTs (mostly in the East region) said that there were no teachers for that subject. It is unknown what the teaching arrangements for the subjects are in those MTs.

As illustrated in the Table 6.7, across all four subjects areas, at the national level less than 15 percent of teachers were already certified. The lowest proportion of certification was among Indonesian teachers, where only 1 in 10 teachers was certified, compared with between 13 and 15 percent for the other subjects. Curiously however, Indonesian had the highest proportion of teachers with at least an undergraduate degree. The reason might be related to the criteria set by the Government regarding the requirements to be considered for certification (e.g., age). Close to 75 percent of the Indonesian teachers holds an undergraduate degree. The proportion of Mathematics, English and Science teachers with at least an undergraduate degree is around 65 percent.

Across the regions there were only slight variations to these proportions, except for the West, where there were notably low rates of certified language teachers. Only 6.2 percent of English teachers and 4 percent of Indonesian teachers were certified. Conversely, in the East, 20 percent of English teachers were certified. English teachers in this region are also more likely to have an undergraduate degree in English.

There have been reports that out-of-field teaching is a common occurrence in Indonesian madrasahs (and MoNE schools for that matter), although exact data is not available. The current study found that approximately half of the core subject teachers had an undergraduate qualification in a relevant subject area, although the figures were slightly lower for Mathematics (47.1 percent) and Science (46.5 percent). In particular, there were notable shortages (e.g., Mathematics teachers in Java and Science teachers in the West).

ADMINISTRATION AND MANAGEMENT

This section presents results from questions about management and administrative processes in MTs. Principals were asked questions on administrative processes including effective school days, reporting requirements and policies and organisation at the madrasah. They were also asked to provide specific documentation to support their answers. Instances where less than 80 percent of evidence is sighted will be noted. Information on school management processes were also collected through questions on how important certain organisations and leaders are in making important decisions at the school.

Administrative Processes

Principals were asked whether or not their school has in place a number of administrative and reporting processes often found in schools. Their responses are summarised in Table 6.8. It shows that such practices are commonplace is the sampled MTs, and that for almost all processes there was little variation between regions.

Table 6.8 Administrative Processes in MTs, by Region

	Overall	Java	West	East
Organisational structure with roles and responsibilities	88.7	88.0	84.0	94.0
Parent-teacher or school-community committee				
With elected members	54.0	40.0	42.0	66.0
Members are not elected	44.7	58.0	56.0	34.0
Annual plan (incl. budget and maintenance plan)	86.7	96.0	82.0	82.0
Code of conduct for students	84.7	90.0	76.0	88.0
Code of conduct for teachers	76.0	88.0	68.0	72.0
Visit by school supervisor	97.3	100.0	96.0	96.0
Update and report school statistics to a central body annually	74.7	82.0	72.0	70.0

An organisational structure chart that displays roles and responsibilities can be found in 88.7 percent of MTs. These are often displayed on an office wall and therefore were easily sighted by data collectors. Parent-teacher and school-community committees are also commonly found, with over 98 percent of principals affirming that there is one at their MTs. There was a significant difference among regions, however, on whether or not the committee members were elected. In Java and the West, less than half of such committees had elected members. In the East, however, 66 percent of committees elect their members. It is important to note that the rate that evidence was sighted for this statement – committee meeting minutes – was quite low at 53 percent.

Almost all MTs, or over 95 percent in all regions, had been visited by a school supervisor. Approximately 70 percent of these visits took place within six months prior to the time principals were interviewed. Some principals noted that this was because visits often occur in anticipation of the national exams, which took place less than six months before the data collection for this study.

Close to 85 percent of all MTs have a code of conduct for students. However, fewer have a code of conduct for their teachers (76%). Both codes of conduct for students and teachers are less likely to be available at MTs in the West region, where only 76 percent have a student code of conduct and 68 percent have one for teachers.

Approximately 75 percent of MTs update their school statistics every year and report them to a central body. This is more common in Java, where over 80 percent of MTs do so. According to principals, over 90 percent of MTs report their statistics to MoRA, either directly to the national office or through the regional office, school supervisor or their KKM (Kelompok Kerja Madrasah/Madrasah Working Group). Only around 20 percent do not report to others. Most also send through statistical reports to other organisations or departments, including MoNE, the Foundation or a 'parent' Madrasah, or school committee.

Decision Making

To examine the management structure of madrasahs and existing management practices, principals were asked about the involvement of a number of organisations and individuals in making important decisions at the school. Two specific aspects of school management were asked of principals: teacher employment and curriculum development. For both, they were

asked about the importance certain individuals and organisations have in making decisions around the topic. For curriculum development, principals were also asked about the importance of their role and of others in leading the development of the curriculum.

Table 6.9 Teacher Employment Decisions in MTs, by Region

	Importance Regarding Decisions about the Employment of Teachers		
	Very Important	Of Some Importance	Not Important
School Principal	89.3	10.0	-
MoRA	75.3	15.3	9.3
The Foundation	65.3	20.0	7.3
School committee	52.0	36.0	11.3
MoNE	56.0	26.7	16.7
Local government	42.7	34.7	22.0
Owner of the school	46.7	20.0	21.3
Imam	40.7	32.0	25.3
Parents	35.3	38.0	26.0
Local religious community	24.0	32.7	43.3

Table 6.9 shows that with regards to decisions about the employment of teachers, an overwhelming majority of principals saw themselves as playing a very important role (89.3%). About 75 percent of principals said that MoRA also plays a very important role in such decisions, and the Foundation is also quite important. A similar proportion of principals believe that the school committee and MoNE are either very important or have some importance in decisions regarding teacher employment. More principals, however, consider MoNE not important in making such decisions. This reflects the fact that most MTs are private with closer ties to their respective Foundation than the Government. See Table 6.9 for further information.

Less than half the principals reported that the local government (in this context most often understood by principals as the regional office of MoRA), the owner of the school and the school religious leader (imam) as very important players in making decisions on teacher employment. Between 20 and 25 percent find them not important in making such decisions. Fewer principals find parents and the local religious community important in making these decisions.

When it comes to curriculum development, principals see themselves as very important in leading the process, although as Table 6.10 shows, they also consider the Madrasah Working Group/KKM very important. Over half of the principals suggested other groups as important in taking leadership of the curriculum development process. The Subject-Based Teacher Working Group (Musyawarah Guru Mata Pelajaran / MGMP) was selected by 28 percent of these principals, and the Foundation by a further 25 percent. Another 10 percent consider the school supervisor important in leading curriculum development in their school. There were also a few references to teachers, a committee and parents. Refer to Table 6.10 for further detail.

It is not surprising then, that principals are very important in making decisions about the content of the school curriculum, or more specifically, what is taught and for how much time. Following themselves, in order of the percentage of principals that consider them very important in this process are MoRA, MoNE and the Foundation linked to the school. Parents and

the local government were found to be of some importance by around 40 percent of principals, but not considered important by around 30 percent of them. The local religious community was not deemed to be important by around 40 percent of principals, and only considered of some importance by about another 35 percent.

Table 6.10 Curriculum Development Decisions in MTs, By Region

	Importance in Leading Curriculum Development		
	Very Important	Of Some Importance	Not Important
School Principal	88.0	12.0	-
Madrasah Working Group/KKM	74.7	24.7	0.7
Other	50.0	11.3	-
	Importance Regarding Decisions about What is Taught and for How Much Time		
	Very Important	Of Some Importance	Not Important
School Principal	86.0	12.7	1.3
MoRA	78.7	18.0	3.3
MoNE	62.7	26.7	10.0
The Foundation	57.3	23.3	12.0
School committee	41.3	40.7	17.3
Imam	34.7	39.3	24.0
Owner of the school	34.7	32.0	22.0
Parents	31.3	41.3	27.3
Local government	28.0	43.3	28.0
Local religious community	22.7	34.7	40.7

LESSONS AND ASSESSMENTS

Principals were asked about the requirements made of their teachers in developing and submitting lesson and assessment plans. Verification was conducted by data collectors, who then asked for a copy of a teaching lesson and assessment plan from the classroom or homeroom teacher of the class group which they had tested. Data collectors were asked to report whether or not the plans they sighted contained a number of elements. Principals were also asked about classroom monitoring and school reporting practices at their school, and were asked to provide recent reports to data collectors as evidence.

Table 6.11 provides information on lesson and assessment plans. Over 90 percent of principals stated that all teachers in their school are required to prepare lesson plans. When teachers were checked, almost all were able to provide evidence of this. There is some regional variation in that a higher proportion of teachers in Java are required to prepare lesson plans than in the other two regions. The lesson plans of over 90 percent of teachers included an outline of class content, objectives of the class and the teaching methods to be used in the class. In approximately 85 percent of lesson plans, student activities were also outlined. There was little regional difference except for the low rate of inclusion of teaching methods to be used in the lesson plans of teachers in the West region, which is 10 percent lower than the overall average.

Table 6.11 MTs Teachers' Lesson Plans and Assessment Plans, by Region

	Overall	Java	West	East
Classroom Practices				
All teachers are required to prepare lesson plans	94.0	98.0	90.0	94.0
Evidence sighted	93.1	94.0	90.0	89.6
Content of lesson plan:	13.5	16.0	12.3	12.0
Outline of class content	93.3	94.0	94.0	92.0
Objectives of class	94.7	96.0	94.0	94.0
Teaching methods to be used	90.7	92.0	80.0	90.0
Student activities	85.3	84.0	82.0	90.0
Principal or head teacher maintains record of classroom observations and feed-back:				
Never	36.0	30.0	48.0	30.0
Occasionally	23.3	26.0	22.0	22.0
Once per semester	24.0	26.0	20.0	26.0
Twice per semester (or more)	16.7	18.0	10.0	22.0
Evidence sighted	57.1	58.5	36.0	55.0
Assessment and Reporting Practices				
All teachers are required to prepare assessment plans	69.3	68.0	66.0	74.0
Evidence sighted	60.4	67.3	55.1	58.7
Content of assessment plan:				
Observation	44.0	44.0	40.0	48.0
Assignments	79.3	80.0	72.0	86.0
Short tests	74.7	86.0	68.0	72.0
Regular feedback and remediation	41.3	46.0	32.0	46.0
All teachers report assessment results for each students to principal at the end of the semester in the form of grades	96.7	96.0	96.0	98.0
Evidence sighted	82.8	81.4	76.6	90.9
Results of mid-year and final exams reported to parents at the end of the semester	92.0	94.0	88.0	94.0
Evidence sighted	83.2	84.4	80.5	84.4
Reporting of mid-year and final exams to MoRA	32.7	34.0	32.0	32.0
Evidence sighted	55.7	47.8	56.5	62.5

Despite almost 75 percent of principals reporting that they conduct classroom observations during which they take notes and provide feedback to teachers, 36 percent said that this does not occur in their school. Notably, almost half of the principals in the West region do not carry out these observations. Equal proportions of principals, around 24 percent, conduct classroom observations and provide feedback to teachers either occasionally or once a semester. Approximately 16 percent of principals do this twice a semester.

Close to 70 percent of principals stated that teachers in their school are required to prepare an assessment plan. Most of the evidence from these schools was successfully gathered from selected teachers. Of the assessment plans that were sighted, a majority were found to include assignments (close to 80%) and short tests (close to 75%). However, less than half included observation and plans for regular feedback and remediation. These proportions are fairly

similar across regions, except for the West where fewer teachers included regular feedback and remediation in their assessment plans.

According to over 96 percent of principals, all teachers are required to report assessment results for each student to the principal at the end of the semester in the form of grades. In turn, 92 percent of principals said that results of mid-year and final exams are reported to parents at the end of the semester. However, only around 33 percent of principals report mid-year and final exam results to MoRA.

SCHOOL-LEVEL FACTORS AND CORRELATIONS

Correlation analyses were conducted between the information that principals provided on their MTs during their interview, and the aggregate of responses to the SLQ by students in that MTs. The variables reported at the national level were those with a correlation coefficient greater than 0.17 or twice the associated standard error of 0.08. At the regional level, correlations between school-level variables and Attitude to School Life score were considered non-trivial if it exceeded 0.27 or twice the associated standard error of 0.13.

As shown in Table 6.12, few school-level factors were correlated with the aggregated negative attitudes to school life score of sampled students at that school. Not surprisingly, school-level factors seemed to have a stronger correlation with students' perception on school life than student background factors. Two school variables were found to be adversely correlated to negative attitudes to school: general condition of school building and visit by school inspector. Students whose schools were in better physical condition reported lower rates of negative attitudes to school life, as did students in schools that had been visited by a school inspector.

Table 6.12 Correlates Between School Factors and Attitudes to School Life

	SLQ Score	Negative Score
General condition of school building (1=school needs complete rebuilding, 6=school is in good condition)	-.068	-.197
Visit by school inspector (1=never, 2=has occurred)	-.029	-.194
Religious leader (imam) - Importance regarding decisions about what is taught and for how much time	.047	.261
The Foundation - Importance regarding decisions about what is taught and for how much time	.019	.214
The Foundation - Importance regarding decisions about the employment of teachers	.038	.171

Principal's perception on the importance of the school's Foundation in making both decisions about the employment of teachers and teaching at the school, as well as the importance of the school religious leader (imam) in making decisions about teaching at the school, were positively correlated with negative attitudes to school. Students in schools where principals find the Foundation and the imam more important in those decisions reported higher agreement ratings to negative statements about school life.

As Table 6.12 shows, Principals' perception on the importance of the Foundation and the imam in deciding what is taught and the amount of time attributed to each area taught at their school

show comparatively higher correlation with students' negative attitudes to school. What this may tell us is that students in schools with linked religious foundations and religious leaders that have a higher influence in the schools' teaching priorities are more likely to have said that they have negative attitudes towards life at the school.

Various stakeholders of this project indicated their interest in the relationship between attitudes to school life and school size. Results of the correlation analyses found that the relationship between school size, measured by the size of student enrolment at the whole school and both positive SLQ score (-0.046) and negative items (-0.088) are not significant. This is consistent with findings from Mok and Flynn (1997), who, even after using more sophisticated quantitative analyses supported by qualitative analyses, found no apparent relationship between school size and quality of school life.

SUMMARY

This chapter detailed the information collected from the principal interviews, including general school characteristics, staffing and administration and management processes. Results included the following highlights:

- A majority of MTs (64.7%) are located in rural areas, and a further 22.7 percent are located at or near small towns.
- The mean enrolment size overall was 184 students, which is slightly higher in the West (211 students) and slightly lower in Java (117 students).
- There was a strong correlation between MTs type and enrolment size, with public MTs being larger on average than private MTs.
- The majority of MTs principals (over 80%) have at least an undergraduate degree. However, less than 60 percent have undergone specialised training in school management. Among those, such training ran for an average of 1.2 weeks.
- Approximately 88 percent of principals also regularly teach classes at their MTs, and those who do, teach an average of 9 lessons per week.
- Around 20 percent of teachers are civil servants (PNS). The remainder are either permanent teaching staff employed by the foundation that fund the MTs (52.7%) or honorary teachers (27%).
- The most common qualification held by teachers is an undergraduate degree (65.6%).
- 18.2 percent of MTs teachers have only completed secondary education themselves.
- Overall, there is a ratio of around 19 students for every teacher with at least an undergraduate degree qualification.
- Over half of teachers are yet to commence the certification process. Highlighting the shortage of certified MTs teachers further, there is currently a ratio of approximately 80 students for every certified teacher.
- Of the four core subjects that were the focus of this study, there are notable shortages of qualified (defined as having at least an undergraduate qualification in the subject area) Mathematics teachers in Java and Science teachers in the West – as there are less than 40 percent of such teachers. However, across all subjects and all regions, only around half of MTs teachers are qualified.
- There are also notable shortages of certified teachers in the four core subjects in all regions, but particularly in English and Indonesian teachers in the West.

- Principals see themselves as very important in leading curriculum development, as well as making decisions about what is taught at school and for how much time, and about the employment of teachers. On these topics, MoRA was found to be almost as important.
- Foundations were found to be the third most important player (65.3% of principals considered them very important) in deciding the employment of teachers.
- Although over 90 percent of teachers are required to develop lesson plans, in around one third of MTs, there is no system of classroom observation by principal.
- Close to 70 percent of MTs teachers are required to prepare assessment plans. However, only 44 percent of teachers' assessment plans include observation, and only 41.3 percent include regular feedback and remediation for students.
- General physical condition of school buildings appeared to have an inverse correlation with negative attitudes to school. Students whose school buildings were found to be in better condition reported lower negative attitudes to school life.
- Students of schools that have never been visited by school inspectors also reported a stronger negative attitude to school life.
- Students of schools lead by principals who believe that the school's Foundation and the school imam are important in deciding what gets taught at the school reported a stronger negative attitude to school life.
- There was no apparent correlation between school size and quality of school life, which is consistent with the finding of past research.

► Photo: Marbawi

7 | MADRASAH FACILITIES AND THE MINIMUM SERVICE STANDARDS

7. MADRASAH FACILITIES AND THE MINIMUM SERVICE STANDARDS

Continuing on from the previous chapter, which detailed the characteristics of madrasah, staffing levels and processes, this chapter presents findings on the facilities and resources at MTs. The information in this section was sourced from two different instruments: (i) information on the availability of general facilities that have been found to be linked to achievement or are indicators of school wealth, were collected through principal interviews; and (ii) information on the availability of selected items from the Draft Minimum Service Standards (MSS) were collected through the School Inventory which was completed via observation by the field team.

BUILDINGS AND FACILITIES

General Condition of Buildings

Principals were asked during interviews to determine the general condition of their schools' building with five descriptive options (see Table 7.1). Data collectors were also asked to provide their assessment of the general school building conditions. Although there is a strong correlation between principals' and data collectors' assessment of the condition of madrasah buildings in Java and the East, in the West the correlation coefficients were below 0.2. The information provided on condition of madrasah buildings in this report, therefore, were obtained from the data collectors as unbiased assessors.

Table 7.1 General Condition of Buildings, According to Principals and Data Collectors, by Region

	Overall	Java	West	East
School needs complete rebuilding	12.7	14.0	16.3	8.2
Some classrooms need major repairs	33.3	34.0	34.7	32.7
Most or all classrooms need minor repairs	24.0	18.0	20.4	34.7
Some classrooms need minor repairs	16.0	16.0	18.4	14.3
The school is in good condition	12.7	18.0	10.2	10.2

Table 7.1 shows that overall, only 12.7 percent of madrasah buildings were in good condition. Most MTs were in need of either minor or major repairs, while another 12.7 percent were found to be in need of complete rebuilding. Correlation analyses found that there are small correlations between the physical condition of MTs buildings and school size (0.23), and a stronger correlation with the factor score produced by school facilities (0.36, see below for more information on school facilities examined in this study).

Madrasah Facilities

As part of the principal interviews, principals were asked whether or not 23 different types of facilities are available at their MTs. This list was compiled from previous educational research studies in other developing countries (e.g., Africa and Vietnam), which indicated facilities that were found to have some link to student achievement or were useful indicators in measuring school wealth.

Table 7.2 lists these facilities and the percentage of MTs where the facilities were found, in order of ubiquity at the overall level. As the table shows, almost all MTs – and 100 percent of Javanese MTs – are powered by electricity. Over 85 percent of MTs overall also have a teacher/staff room, a television and a computer. The latter two findings were surprising, noting for example that there are more MTs that have a computer than those that have piped water, or a first aid kit. However, this may be a result of government and/or private ventures that were aimed at providing schools with various technologies. For example, (i) the government's one computer per school program; and (ii) principal informed data collectors that shortly before this study commenced, his school received two television sets from a major electronics firm as part of a national distribution aimed to reach every school in the country. He noted that they have yet to be used as the schools area has limited television reception and they do not have supporting hardware or educational materials to use on them. It must be noted therefore, that the question posed to principals was limited to whether or not these facilities exist at their school, and not how or whether they are being used.

Further, over three-quarters of MTs have running water and a sports area, while around 60 percent have a DVD player, first aid kit, typewriter and a fence or hedge surrounding the school. At the other end of the spectrum, less than 20 percent of MTs have internet access. Similarly, few MTs have a dedicated science laboratory, an overhead projector, a photocopier or a fax machine. Also a scarcity of MTs overall have a separate store room, radio, landline telephone, tape recorder, VCR or school/community hall – with less than half of the MTs having these facilities.

Table 7.2 shows that on average, MTs in Java are considerably better resourced than those in the West or East, particularly in regard to multimedia equipment. For example, 84 percent of MTs in Java have a DVD player as opposed to 56 percent in the West and 48 percent in the East; 60 percent of MTs in Java have a radio as opposed to 30-40 percent in the other regions; 52 percent have a tape recorder compared to about 30 percent in the other regions, and 40 percent have a VCR as opposed to around 20 percent in the other regions.

Table 7.2 Percentage of MTs with Selected Facilities, by Region

	Overall	Java	West	East
Electricity (mains, generator or solar)	92.0	100.0	84.0	92.0
Teacher/staff room	85.3	88.0	84.0	84.0
Television	85.3	90.0	80.0	86.0
Computer	85.3	98.0	74.0	84.0
Piped water/tank water/spring	78.7	90.0	70.0	76.0
Sports area/play ground	78.0	76.0	82.0	76.0
DVD player	62.7	84.0	56.0	48.0
First aid kit	60.7	72.0	52.0	58.0
Typewriter	60.7	66.0	66.0	50.0
Fence/hedge around school borders	60.0	62.0	48.0	70.0
Separate office for principal	54.0	56.0	46.0	60.0
Canteen/co-operative	50.7	64.0	42.0	46.0
Store room	47.3	64.0	36.0	42.0
Radio	43.3	60.0	32.0	38.0
Landline telephone	40.7	56.0	34.0	32.0
Tape recorder	38.0	52.0	28.0	34.0
VCR	28.7	40.0	22.0	24.0
School/community hall	25.3	28.0	22.0	26.0
Internet access	19.3	34.0	12.0	12.0
Science lab	15.3	16.0	14.0	16.0
Overhead projector	8.7	8.0	4.0	14.0
Photocopier	7.3	6.0	6.0	10.0
Fax machine	6.7	14.0	0.0	6.0

Variables Correlated with Level of Madrasah Facilities

As discussed above, there is a difference between the three regions in terms of the school facilities available. Correlation analyses were conducted to gain an insight into the characteristics of well-resourced and poorly-resourced MTs. To obtain an index of level of school resources, a confirmatory factor analysis was performed. This analysis revealed that all items except a typewriter contribute to the factor "level of school resources". Reliability analyses also confirmed that removing typewriter from the index increased the scales reliability (Cronbach's Alpha) to 0.801 from 0.762. The resulting factor scores from all facilities except typewriters were saved as a variable to indicate MTs level of school resources. This method allocates more weight to facilities that were found to contribute more to the index (such as landline telephone, computer and first aid kit) than those that contribute less (such as school/community hall, sporting ground and teacher/staff room).

Table 7.3 shows that based on regional means, with the national average set at 0 (with a standard deviation of 1), Java MTs had a considerably higher factor score of resources than the national average, while the average factor score for MTs in the West was lower. The factor score for the East was also below the national average. It must be noted, however, that the standard deviation scores are substantial, suggesting variation within regions. The correlation coefficient between factor score of resources and region variable recoded with the order 1=Java, 2=East and 3=West is -.358.

Table 7.3 Factors that Correlate with Level of School Resources, by Region

	Overall	Java	West	East
Mean factor score of resources (excl. typewriters)	.000	.481	-.394	-.106
Standard deviation	1.000	.841	1.059	.883
Correlation between factor score of resources and:				
School type (1=Private, 2=Public)	.329	.194	.455	.339
Principal's education	.387	.153	.480	.509
School location (1=remote, 5=urban)	.403	.394	.535	.393
Number of teachers	.491	.282	.551	.543
Total number of students	.477	.241	.717	.501
Average class size	.315	.072	.608	.268

Table 7.3 also presents the other characteristics that were found to be correlated with level of school resources indicated by its factor score. It shows that overall schools in more urban locations tended to be better resourced, with fairly consistent correlations in all three regions. What is notable is that these correlation coefficients are much stronger in the West, with the overall lowest level of school resources. In the West, level of school resources is strongly correlated with school size, average class size, location and number of teachers. This highlights the disadvantage faced by smaller schools in remote/rural locations in terms of their access to school resources. Similarly medium to strong correlations with these factors were also found in the East region.

Small schools are often the only option for students in remote or rural areas, which is supported by the link between school size and location. Smaller schools are more often found in more remote regions in Java (correlation coefficient of .478), the West (.309) and the East (.393). The findings show that school size and location are correlated strongly with level of school resources. The link between these factors and achievement is examined in Chapters 8 and 9.

School Libraries

Principals were asked about the availability of school libraries and books for loan by students. This was intended to establish students' access to reading materials outside of textbooks that they can borrow from school. In the interview, school library was defined as a dedicated room or building with at least one shelf of books. The description of the results is presented in Table 7.4. Overall, slightly more than half of the MTs have school libraries from which students can borrow books. A further 11 percent have school libraries but do not lend books to students (the assumption here is that students are allowed only to read books within the library/school), while around 32 percent do not have a library.

Table 7.4 Libraries at MTs, by Region

	Overall	Java	West	East
We have no school library	32.0	26.0	44.0	26.0
We have a school library but we do not lend books	11.3	14.0	10.0	10.0
We have a school library and we lend books	56.7	60.0	46.0	64.0

Consistent with findings on level of school facilities discussed previously, school libraries are least commonly found in MTs in the West, where 44 percent of principals stated that they do not have one. The levels of availability of school libraries in Java and in the East are similar, although slightly more MTs in the East loan library books to students than in Java.

DRAFT MINIMUM SERVICE STANDARDS

A School Inventory based on the draft Minimum Service Standards (MSS) was used to assess the availability of various facilities at MTs. Unlike the general facilities detailed above, which relied on principals' perspectives on the standards and usability of the facilities, the School Inventory was completed by data collectors. The decision of whether or not a facility was deemed as available or adequate relied on the rigid guidelines of the MSS and the training data collectors undertook before heading into the field.

Table 7.5 Presence of MSS Items at MTs, by Region

	Overall	Java	West	East
Mean percentage of MSS items met	45.23	47.30	41.00	47.40
Standard Deviation	22.68	20.26	23.34	23.80
Range (in percentage)	0-100	5-90	0-95	0-100
Presence of selected MSS items (in percentage of MTs):				
Operational washing and toilet facilities for males with a ratio of 1 toilet to 80 male students	42.7	36.0	40.0	52.0
For males, separate hand washing facilities available	22.0	18.0	22.0	26.0
Operational washing and toilet facilities for females with a ratio of 1 toilet to 60 female students	38.0	32.0	38.0	44.0
For females, separate hand washing facilities available	20.7	18.0	22.0	22.0
Teacher room				
with desk and chair for every teacher, non-teaching staff and principal	66.0	60.0	70.0	68.0
with announcement board	87.3	98.0	80.0	84.0
with statistics board	78.0	84.0	68.0	82.0
Separate principal's office				
with desk	83.3	90.0	70.0	90.0
with 3 chairs	65.3	62.0	64.0	70.0
with lockable cupboard	74.0	74.0	72.0	76.0
Separate science laboratory	15.3	16.0	12.0	18.0
Science laboratory				
with desk and chairs for at least 32 students	8.7	8.0	4.0	14.0
with at least one set of basic science equipment for demonstration of experiments	35.3	42.0	24.0	40.0
with model of a human skeleton	35.3	40.0	36.0	30.0
with model of a human body	46.0	50.0	42.0	46.0
with globe (earth)	60.7	70.0	60.0	52.0
with examples of optical equipment	30.7	34.0	22.0	36.0
with posters featuring natural sciences topics	40.0	48.0	34.0	38.0
Library				
with at least 200 items of enrichment materials	38.7	42.0	30.0	44.0
with at least 20 reference books	57.3	68.0	40.0	64.0

Each of the 20 MSS items is presented in Table 7.5, along with the percentage of MTs in which the item was found. The first notable finding is that not a single item was available in all MTs, which highlights the difficulty of MTs meeting the MSS. Another finding that supports this is the percentage of the items on the MSS list that were found in the MTs. As shown in the table, on average less than half of the items on the MSS list were found in the MTs, which was true for all regions. Only one MTs in the East had met all 20 of the MSS assessed. This equates to only 0.7 percent of the total weighted MTs population. Conversely, 1.3 percent of the overall weighted population were found to have none of the MTs items on the list. Although MTs in the West were again found to have the lowest level of MSS items, the difference is not as stark as that of the general facilities discussed earlier. Also in contrast to the findings for general facility items above, the level of MSS items in Java and the East were found to be similar.

Table 7.5 also shows that there is a fairly high percentage of MTs that meet the requirements for some of the standards. For example, over 87 percent of MTs have teacher rooms with an announcement board, in 78 percent of MTs there is a statistics board, and in 66 percent of MTs there is a desk and chair for every teacher, non-teaching staff and the principal. A separate principal's office can be found in 83 percent of MTs, and the office contains a lockable cupboard in 74 percent of MTs and at least three chairs in 63 percent of MTs. There are variations between regions in these figures, but these items are all present in above 60 percent of MTs.

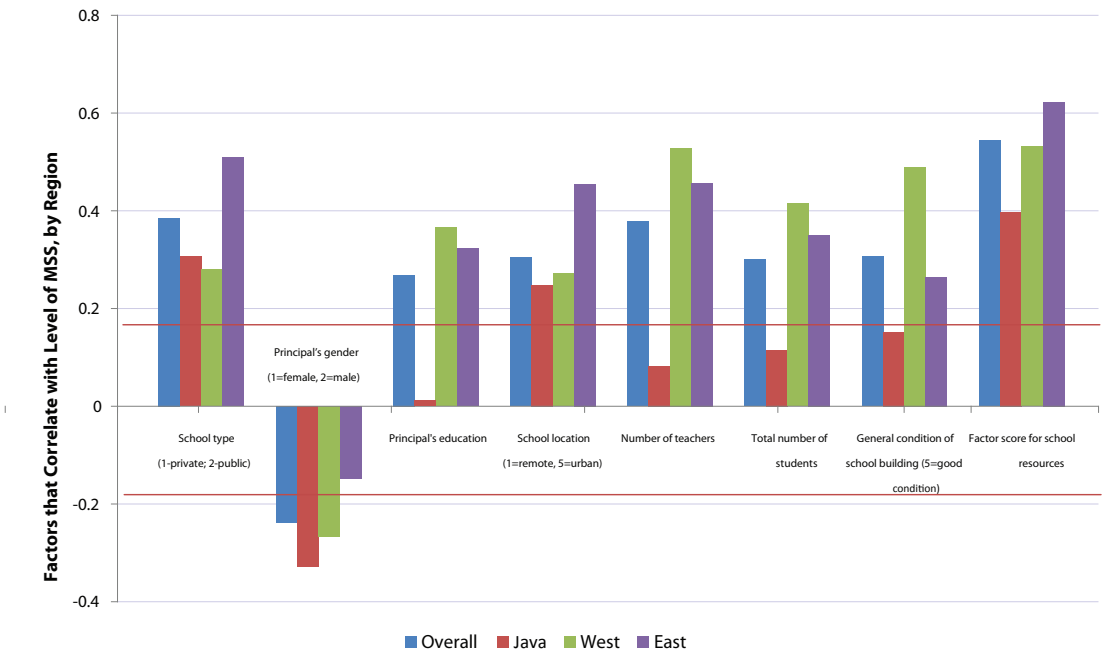
In contrast, Table 7.5 highlights the shortage of MTs that meet the MSS requirements for adequate washing and toilet facilities, a science laboratory, and a library. Notably low are the percentages of MTs that meet the MSS requirement of a science laboratory with a 'desk and chair for at least 32 students'. This, however, can be partly explained by this study's finding that the average class size at approximately 54 percent of MTs is less than 32 students. Nonetheless, the findings suggest that effort must be made to improve facilities for students, including those related to hygiene, a science laboratory, and a library.

As with the general facilities above, correlation analyses were conducted to examine MTs characteristics that were linked with the level of MSS items available at the MTs. The findings are summarised in Table 7.6. It was found that these correlations are stronger in the West and East regions, where MTs that have a higher number of MSS items tend to be led by principals with higher education levels and have higher student enrolment numbers and more teachers. In the East, there is a strong correlation with school type, where public MTs are more likely to have more MSS items than private MTs. This correlation also exists to a lesser extent in the other two regions. There is also a stronger correlation in the East between number of MSS items and school location, with a tendency of more urban schools to have more MSS items.

Table 7.6 Factors that Correlate with Level of MSS, by Region

	Overall	Java	West	East
School type (1=private, 2=public)	.385	.306	.280	.509
Principal's gender (1=female, 2=male)	-.238	-.328	-.267	-.148
Principal's education	.269	.012	.366	.323
School location (1=remote, 5=urban)	.305	.248	.272	.455
Number of teachers	.378	.083	.529	.457
Total number of students	.300	.116	.415	.351
General condition of school building (5=good condition)	.306	.152	.490	.264
Factor score for school resources	.544	.398	.531	.623

Figure 7.6 Factors that Correlate with Level of MSS, by Region



SUMMARY

This chapter presented findings on madrasah resources, both of general facilities and of specific items from the draft Minimum Service Standards. The chapter included the following highlights:

- 18 percent of school buildings in Java are in good condition, and about 10 percent in the West and East regions are.
- One-third of MTs nationally were found to have some classrooms in need of major repairs, and most or all classrooms in one-quarter of MTs were found to be in need of minor repairs.
- MTs in Java are better resourced than those in the West and East. This difference was more pronounced for multimedia equipment (e.g., DVD player, radio, tape recorder, VCR).
- MTs in the West had the lowest level of resources.
- Using an index of school facilities, a very strong correlation (.717) was found in the West between school size and level of school resources. A medium level correlation between these two variables (.501) was also found in the East.

» In the West and East, strong correlations were found between level of school facilities and school location, and for number of teachers.
» Overall and across the three regions, MTs on average had between 40 and 50 percent of the items on the list of 20 MSS facilities. Only 0.7 percent of MTs had all items (equating to only one MTs), and twice as many MTs had none.
» Considerably more MTs met the MSS requirements for teacher room and principal office than those that met MSS requirements for washing facilities, science laboratories or libraries.
» Correlates of the level of meeting the MSS were: school type (public schools had a higher percentage of MSS items), school location (urban schools had a higher percent), principal's gender in Java (schools led by women had a higher tendency to have more MSS items), and student enrolment size, total number of students and general condition of school buildings in the West and East regions.

► Photo : M Wildan

8 CORRELATIONS BETWEEN STUDENT BACKGROUND FACTORS AND ACHIEVEMENT

8. CORRELATIONS BETWEEN STUDENT BACKGROUND FACTORS AND ACHIEVEMENT

This chapter describes the relationships between student characteristics and achievement in the four curriculum areas tested. These analyses do not allow causal conclusions to be drawn in terms of how background characteristics of students and schools influence achievement. Still, results of correlation analyses can provide evidence regarding which student background characteristics are related more strongly to achievement than others. As analyses are again undertaken and reported overall and by region, similarities and differences across Java, the East and the West are reported.

It should be noted that typically, the sizes of correlation coefficients found between the variables measured in the current study (e.g., student and principal responses and educational achievement) were relatively low when compared with correlation coefficients found in the natural sciences and engineering. In a seminal article on this topic, Cohen (1992) put forward an interpretation of effect sizes for correlation coefficients in psychological and educational research which considers a correlation of 0.10 as small, 0.30 as medium and 0.50 as large.

Results of the correlation analyses are reported below, first for the relationships between general student characteristics and achievement, followed by subject-specific variables relating to homework and extra tutorials and achievement in the corresponding subject area.

CORRELATIONS BETWEEN STUDENT CHARACTERISTICS AND ACHIEVEMENT

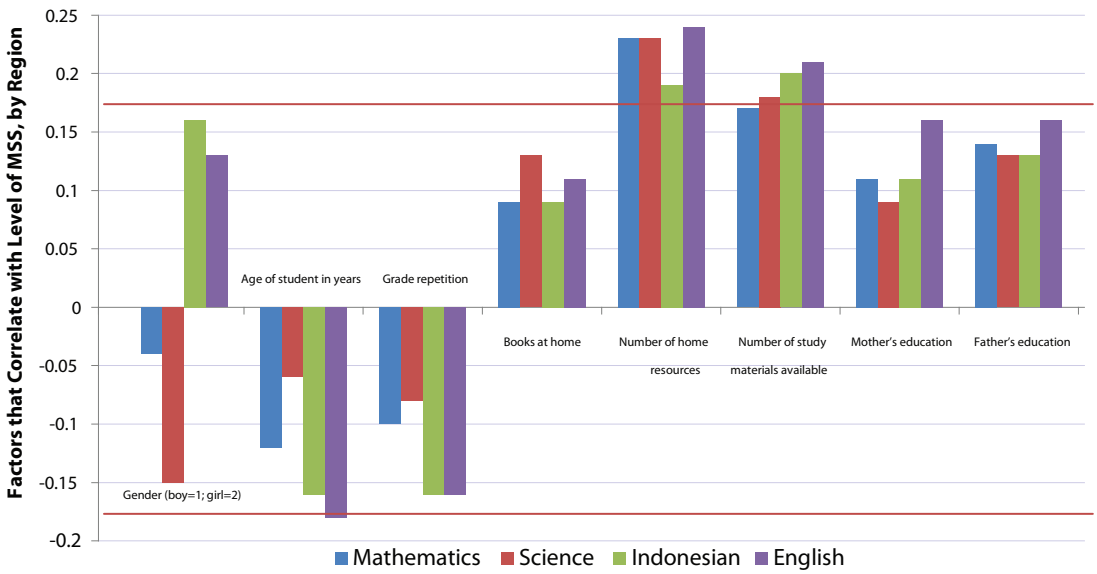
Correlations[1] and their corresponding standard errors[2] between all variables for which information was obtained in the student questionnaire and academic achievement in the four subject areas were calculated. For reporting, variables were assigned to two groups. The first group includes general variables, such as demographics, measures of socio-economic status and information regarding school attendance and the borrowing of books from school. Due to the large number of variables, only those which correlated with achievement on a non trivial level (i.e., above 0.1) were tabulated. The second group covers instructional variables such as lessons per week, homework and extra tutorials taken in the four subject areas. For this group, all results are reported.

Table 8.1 Correlates of Student Characteristics and Achievement, Overall*

	Mathematics	Science	Indonesian	English
Gender (boy=1; girl=2)	-.04	-.15	.16	.13
Age of student in years	-.12	-.06	-.16	-.18
Grade repetition	-.10	-.08	-.16	-.16
Books at home	.09	.13	.09	.11
Number of home resources	.23	.23	.19	.24
Number of study materials available	.17	.18	.20	.21
Mother's education	.11	.09	.11	.16
Father's education	.14	.13	.13	.16
Student's expected education	.06	.08	.11	.05

Notes: Apart from gender, all variables were coded to show that higher codes mean 'higher' or 'more' than lower codes.
** all standard errors were 0.03.*

Figure 8.1 Correlates of Student Characteristics and Achievement, Overall



[1] Unless otherwise stated, all analyses are Spearman's rho correlation coefficients. This measure of association is appropriate when examining associations which involve ordinal scaled variables in studies with more than 20 cases.

[2] Standard errors of the correlation coefficients reported in this chapter were calculated as follows: SE(rho)=(1-rho2)/√(effective sample size). For details regarding effective sample size see the chapter on methodology.

Table 8.1 shows the correlation coefficients between those general student background variables and overall achievement in Mathematics, Science, Indonesian and English that exceeded 0.1 in at least one instance. A non-trivial relationship with achievement was found for gender, student's age and grade repetition, resources and books at home, parental education and student's expected level of education.

Female students were assigned a higher code (i.e., '2') than male students (i.e., '1'), and this must be taken into account when interpreting the data presented in Table 8.1. Results showed that:

- Gender differences were most pronounced for Indonesian (0.16), followed by Science (-0.15) and English (0.13).
- Boys outperformed girls on the Science test
- Girls outperformed boys on the Indonesian and English tests.
- No significant gender differences were noted for Mathematics.
- The QEM results are therefore in line with results of other large-scale studies which have repeatedly shown that girls outperform boys in languages and reading (Lietz, 2006; OECD, 2009). Similarly, the TIMSS found consistencies in results for the period 1995 to 2003, where most countries found that boys performed better on Science than girls, and significant gender differences were not evident for Mathematics.

The correlations for age and grade repetition with achievement show that:

- Older students and those who have repeated a grade during their schooling achieved at a lower level. This means that students who are older than their peers in Year 9 tend to be those who started school a little later, perhaps because they were deemed not to be quite school-ready and that a bit of additional time prior to school might assist their development.
- Likewise, those who had to repeat a grade tended to be those students who at some point in their school career struggled with the curriculum. Again, these results are in line with findings reported previously. Indeed, Hattie (1999) reported a similar negative average effect size of -0.15 across 861 studies, leading him to conclude that "retention is overwhelmingly disastrous...at enhancing academic achievement" (p. 7).

The next set of variables which showed a small correlation with achievement relates to the resources available to students at home. The findings are summarised in Table 8.1.

- The variable with the highest correlation across all subject areas was the number of resources students reported having access to at home. Thus, those students who have a greater number of resources (perhaps reflecting their parents' wealth) such as a daily newspaper, monthly magazine, television, computer, car, piped water and electricity, perform at a higher level.
- In addition, the more study materials students have access to at school such as pencils, pens, calculators and textbooks, the higher the achievement levels tend to be in all four subject areas.

- The number of books to which students have access to at home is more strongly linked to achievement in Science (0.13) and English (0.11), than it is to achievement in Mathematics (0.09) and Indonesian (0.09).
- Levels of parental education and student's expected level of education attainment were also positively related to achievement. Here, the highest relationship with achievement was reported for father's education.
- Both mother's and father's educational level is most strongly related to performance in English.
- Student's expected level of education, however, showed the strongest link to achievement in Indonesian.

As some of the descriptive statistics showed considerable differences between the three regions on some of the student characteristics (as detailed earlier in the report) and the correlations reported above differed somewhat for the four subject areas, correlations were also computed by region and subject area and are reported in Table 8.2 for Mathematics, Table 8.3 for Science, Table 8.4 for Indonesian, and Table 8.5 for English. In addition to the correlation coefficients, the respective standard errors are given.

Table 8.2 Correlates of Student Characteristics and Mathematics Achievement, by region

	Overall	(SE)	Java	(SE)	West	(SE)	East	(SE)
Gender (boy=1; girl=2)	-.04	.03	-.06	.04	.03	.05	-.04	.05
Age of student in years	-.12	.03	-.10	.04	-.19	.05	-.11	.05
Grade repetition	-.10	.03	-.08	.04	-.09	.05	-.11	.05
Books at home	.09	.03	.11	.04	.13	.05	.10	.05
Number of home resources	.23	.03	.20	.04	.31	.04	.26	.05
Number of study materials available	.17	.03	.11	.04	.26	.05	.30	.05
Mother's education	.11	.03	.11	.04	.18	.05	.14	.05
Father's education	.14	.03	.13	.04	.20	.05	.23	.05
Student's expected education	.06	.03	.16	.04	.16	.05	.07	.05
Note: Apart from gender, higher codes indicate 'higher' or 'more' than lower codes.								

Table 8.3 Correlates of Student Characteristics and Science Achievement, by Region

	Overall	(SE)	Java	(SE)	West	(SE)	East	(SE)
Gender (boy=1; girl=2)	-.15	.03	-.16	.04	-.10	.05	-.16	.05
Age of student in years	-.06	.03	-.02	.04	-.16	.05	-.12	.05
Grade repetition	-.08	.03	-.07	.04	-.08	.05	-.11	.05
Books at home	.13	.03	.15	.04	.15	.05	.13	.05
Number of home resources	.23	.03	.20	.04	.26	.05	.30	.05
Number of study materials available	.18	.03	.13	.04	.23	.05	.29	.05
Mother's education	.09	.03	.07	.04	.14	.05	.18	.05
Father's education	.13	.03	.10	.04	.16	.05	.27	.05
Student's expected education	.08	.03	.17	.04	.10	.05	.05	.05
Note: Apart from gender, higher codes indicate 'higher' or 'more' than lower codes.								

Table 8.4 Correlates of Student Characteristics and Indonesian Achievement, by Region

	Overall	(SE)	Java	(SE)	West	(SE)	East	(SE)
Gender (boy=1; girl=2)	.16	.03	.16	.04	.17	.05	.18	.05
Age of student in years	-.16	.03	-.14	.04	-.23	.05	-.15	.05
Grade repetition	-.16	.03	-.14	.04	-.15	.05	-.19	.05
Books at home	.09	.03	.09	.04	.16	.05	.10	.05
Number of home resources	.19	.03	.14	.04	.25	.05	.26	.05
Number of study materials available	.20	.03	.14	.04	.27	.05	.32	.05
Mother's education	.11	.03	.09	.04	.16	.05	.13	.05
Father's education	.13	.03	.11	.04	.17	.05	.23	.05
Student's expected education	.17	.03	.17	.04	.16	.05	.16	.05
Note: Apart from gender, higher codes indicate 'higher' or 'more' than lower codes.								

Table 8.5 Correlates of Student Characteristics and English Achievement, by Region

	Overall	(SE)	Java	(SE)	West	(SE)	East	(SE)
Gender (boy=1; girl=2)	.13	.03	.14	.04	.14	.05	.06	.05
Age of student in years	-.18	.03	-.15	.04	-.29	.04	-.20	.05
Grade repetition	-.16	.03	-.15	.04	-.14	.05	-.17	.05
Books at home	.11	.03	.11	.04	.22	.05	.06	.05
Number of home resources	.24	.03	.19	.04	.31	.04	.33	.05
Number of study materials available	.21	.03	.12	.04	.34	.04	.32	.05
Mother's education	.16	.03	.14	.04	.24	.05	.18	.05
Father's education	.16	.03	.13	.04	.26	.05	.30	.05
Student's expected education	.05	.03	.12	.04	.18	0.05	.10	.05
Note: Apart from gender, higher codes indicate 'higher' or 'more' than lower codes.								

As was the case for MTs overall, girls and boys tended to perform at a similar level in Mathematics in all regions. Other instances where correlation coefficients are similar across regions include age, grade repetition, and books at home. This means that the differences in Mathematics achievement whereby older students, students who have repeated a grade and students with fewer books achieve at a lower level than younger students, students who have not repeated a grade and those with more books at home are similar in Java, the West and the East.

Regional differences were observed with respect to the other student background variables' correlation with Mathematics achievement. Thus, the number of resources students reported having at home was not as strongly related to achievement in Java (0.20) than it was in the West (0.31) and the East (0.26). Even more pronounced were the differences concerning number of study materials available to students. Whereas in Java, this relationship was relatively small (0.11), it was larger in the West (0.26) and increases to a medium-sized correlation in the East (0.30). Given that the differences between these correlation coefficients exceed the respective standard errors, it can be concluded that the association between study materials and Mathematics achievement is indeed significantly higher in the East and the West than it is in Java. See Table 8.2 for further detail.

This size of the correlation between gender and Science achievement is negative and relatively similar in all regions. Thus, male students performed at a higher level than female students in all three regions. Likewise, the variables grade repetition and books at home showed similar correlations with Science achievement across the regions. This indicates that the performance differences in Science achievement between those students who had repeated and those who had not repeated a grade, as well as between students who had access to a different number of books at home, were similar in Java, the East and the West.

However, most of the correlations between general student characteristics and Science performance differed between the regions. That is, differences regarding the strength of relationship with achievement across the regions were observed for age, home resources, study materials, parental education and student's expected education level.

While virtually no differences in Science achievement were related to age in Java, older students in the West and the East performed at a considerably lower level in Science than did younger students. Achievement differences associated with the number of home resources and achievement were also higher in the East and the West than they were in Java. The same applied to parental education. The reverse applied to student's expected education, in that the correlation between this variable and Science achievement was smaller in the West and the East than it was in Java. This means that differences between higher and lower achieving students in Science depends on the level of education they expect to achieve are greater in Java than they are in the East and the West (refer to Table 8.3 for more information).

Again, achievement differences related to gender and grade repetition were similar across the regions, with girls outperforming boys in all regions and students who had repeated a grade performing at a considerably lower level than non-repeaters. However, unlike in Mathematics and Science, the correlations between expected education and performance in Indonesian were also similar across the regions, indicating that higher levels of expected education are associated with higher achievement in Indonesian to an equal extent in Java, the West and the East (see Table 8.4).

Differences between regions emerged for home resources, study materials and parental education. For all these variables, the link with achievement was far greater in the West and the East than it was in Java, pointing to the lesser importance of these variables for achievement in Indonesian in this latter region (see Table 8.4 for more detail).

In regard to English achievement, while girls outperformed boys in Java and the West, the correlation between gender and English achievement in the East (0.06) was only borderline given the associated standard error (0.05). Results also showed that the number of home resources, study materials and parental education, was more strongly linked to English achievement in the West and the East than in Java. Finally, the considerably higher correlation with achievement for books at home (0.22) and expected education (0.18) shown in the West indicates a greater importance of these variables in regards to English achievement than was the case in the East or in Java.

CORRELATIONS BETWEEN SUBJECT-SPECIFIC VARIABLES AND ACHIEVEMENT

Subject specific variables were correlated with the corresponding subject. For example "Lessons per week in Indonesian" was correlated with students' scores on the Indonesian test.

In addition to information regarding general background characteristics, the student questionnaire included a number of questions that related specifically to Mathematics, Science, Indonesian and English. These questions sought information on instructional time (i.e., lessons per week), frequency and checking of homework, and on hours spent taking extra tutorials.

Table 8.6 Correlates of Subject-Specific Variables and Achievement, by Region

	Overall	(SE)	Java	(SE)	West	(SE)	East	(SE)
Mathematics								
Lessons per week	.18	.03	.16	.04	.16	.05	.09	.05
Frequency homework assigned	.07	.03	.06	.04	.08	.05	.07	.05
Frequency homework checked	.01	.03	.01	.04	.00	.05	.11	.05
Hours extra tutorial	-.01	.03	.06	.04	-.03	.05	-.18	.05
Science								
Lessons per week	.11	.03	.08	.04	.06	.05	.11	.05
Frequency homework assigned	.10	.03	.14	.04	-.02	.05	.06	.05
Frequency homework checked	.05	.03	.08	.04	-.06	.05	.09	.05
Hours extra tutorial	.05	.03	.09	.04	.07	.05	-.26	.05
Indonesian								
Lessons per week	.18	.03	.14	.04	.19	.05	.17	.05
Frequency homework assigned	.07	.03	.07	.04	.02	.05	.07	.05
Frequency homework checked	.05	.03	.00	.04	.06	.05	.21	.05
Hours extra tutorial	.04	.03	.08	.04	.17	.05	-.25	.05
English								
Lessons per week	.14	.03	.13	.04	.12	.05	-.01	.05
Frequency homework assigned	.07	.03	.02	.04	.14	.05	.09	.05
Frequency homework checked	.04	.03	.02	.04	.04	.05	.11	.05
Hours extra tutorial	.07	.03	.09	.04	.10	.05	-.03	.05

Notes: All variables are coded in such a way that higher codes indicate 'higher' or 'more' than lower codes. Subject specific variables were correlated with the corresponding subject. For example "Lessons per week in Indonesian" was correlated with students' scores on the Indonesian test.

Data were correlated with the achievement scores in the respective subject areas and results are provided in Table 8.6. Not surprisingly, the number of lessons per week in a subject was positively related to achievement in that subject. In general, students who reported spending more lesson time in a particular subject also performed at a higher level than students who spent less time learning a subject. A noteworthy exception was the correlation reported in the East for English, where the slightly negative coefficient was not substantively different from zero as indicated by the fact that the standard error is five times greater than the actual correlation.

Negative correlations emerged in the East for number of extra tutorials in Mathematics, Science, and Indonesian. This would appear to indicate that in the East, students who are weaker in the subject areas tend to take extra tutorials which do not help to reduce the gap between them and higher achieving students. Future studies could investigate the accuracy of this suggestion.

Overall, the frequency with which homework is assigned shows a larger association with achievement than the frequency with which homework is checked by the teacher – although this was not the case in the East. This is an important finding for schools and parents given the belief in Indonesia that schools which set a significant amount of homework tend to be "better schools" – meaning that students do better academically than students at other schools. However, correlations differed depending on the subject area and the region, so this belief does not hold true on all occasions.

For Science, the correlation coefficient (0.14) indicated that students who were assigned homework more frequently performed at a higher level than students who had less homework, but only in Java. In the West (-0.02) and the East (0.06), these associations were immaterial considering the associated standard errors (0.05 in both instances). Another difference across regions can be observed for English. Whereas a strong correlation between homework frequency and English achievement is reported in the West (0.14) it is weaker in the East (0.09) and not important in Java (0.02). For Indonesian, it is interesting to note the correlation in the East for frequency homework is checked (.21) compared to the other two regions, and to the correlations for all regions regarding frequency homework is set in Indonesia. The East was the only region where feedback appeared to be more strongly correlated with achievement than the provision of homework. The reason for this is unknown, but perhaps teachers in the East are better at providing timely and appropriate feedback to students than are teachers in the other two regions. This hypothesis could be tested in a future study.

The finding that the usefulness of additional tutorials is questionable means that the resources parents utilise to allow their children to participate in such tutorials might not be money well spent. However, future work is required in the area before parents or schools make any decisions about removing their child's involvement in tutorials.

Finally, the following variables for which information was collected in the student background questionnaire did now show sizeable correlations with any of the achievement scores:

- Language spoken at home
- Location of stay during school week
- Work for family
- Number of meals per day
- Number of days absent
- Ability to borrow library books
- Frequency of obtaining help with homework

SUMMARY

In this chapter, the relationships between characteristics of students and achievement in Mathematics, Science, Indonesian and English were examined. Results included the following highlights:

- Female students achieved at a significantly higher level than male students in Indonesian and English.
- Male students outperformed female students in Science.
- No significant gender differences emerged for Mathematics.
- No achievement differences were observed with respect to the language spoken at home, location of stay during school week, work for family, number of meals per day, school absenteeism, ability to borrow library books from school and the frequency of obtaining help with homework.
- Grade repetition was negatively related to achievement in all subjects, indicating that students who have repeated a grade at some stage during their schooling achieved at a lower level than other students. This relationship is likely mediated by student ability. For example, less academically gifted students are more likely than brighter students to have to repeat a grade, and the former would likely have performed more poorly on the QEM tests as well. Therefore, it is not simply a matter of enacting policy to stop grade repetition. Further research in the area must be undertaken to understand this relationship in more detail.
- With a few exceptions, correlations were higher in the East and the West than they were in Java, indicating that achievement is more strongly linked to student characteristics in the East and West than it is in Java.
- The largest differences in correlations with achievement across the three regions were observed for number of home resources and study materials available to students. Achievement differences related to these factors was greater in the East and West than in Java.
- Correlations with achievement of mother's education were slightly smaller in all subject areas and across all regions than they were for father's education.
- The relationship between student's expected education and achievement differed depending on the subject area as well as the region. Expected education is equally strongly related to achievement in Indonesian in all regions, but is smaller for the East than it is for the West and Java. While for Mathematics, the relationship between expected education and achievement is equally high in the West and Java, in Science the association is strongest in Java, and in English, it is strongest in the West.
- The frequency with which homework is assigned shows larger correlations with achievement than the frequency with which homework is checked, particularly in Science.
- More lessons per week in a subject were consistently related to higher achievement in that subject area.

► Photo: M Wildan

9 | SCHOOL-LEVEL CORRELATES OF ACHIEVEMENT IN MTs

9. SCHOOL-LEVEL CORRELATES OF ACHIEVEMENT IN MTS

This chapter focuses on the relationships between achievement and school characteristics as well as the context in which schools operate. In total, the principal questionnaire and the school inventory obtained information on more than 200 variables. In order to reduce this to a manageable number, correlations with achievement are reported for only those variables that showed relationships which were non-trivial in size.

In order to judge which correlation coefficients at the school-level to consider non-trivial, the rule was applied that a correlation coefficient had to exceed twice its standard error. As an approximation, given the overall sample size of 150 MTs in the current study, this meant that a correlation coefficient for madrasahs overall had to exceed 0.17 (associated standard error 0.08). Correlation coefficients for the regions in which 50 schools had been sampled had to exceed 0.27 (associated standard error 0.13). It should be noted that correlations for "overall" were weighted by the school weight to adjust for differential number of schools represented by one school in each of the three regions (1 for 130.02 in Java; 1 for 64.94 in the West and 1 for 45.88 in Java). In addition, achievement scores were aggregated to the school mean while applying the student weight. Finally, for categorical variables such as school type or school location, Spearman correlation coefficients were computed whereas for variables that were continuous such as a school's distance from certain facilities or number of teachers and students, Pearson correlation coefficients were computed.

As mentioned in Chapter 8, correlations do not imply causation. They do, however, provide evidence regarding the relative strength of relationships between school characteristics and achievement. This, in turn, provides policy-makers, researchers and educators with information regarding which variables to consider more important in the pursuit of further research and when considering decisions regard school funding and policies.

In the following sections, results of the correlation analyses between school-level variables and achievement are reported, first for variables indicating general school context and administrative practices, second for indicators of schools' human resources and teaching activities and third for variables related to schools' physical resources.

CORRELATIONS BETWEEN GENERAL SCHOOL CONTEXT AND ACHIEVEMENT

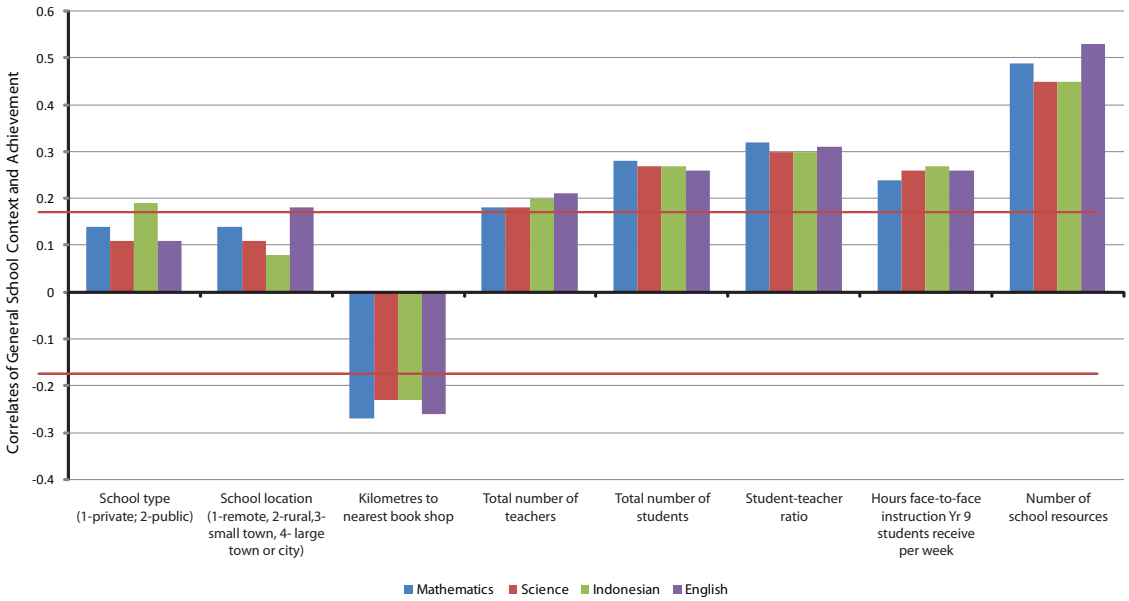
Table 9.1 Correlates of General School Context and Achievement

		Mathematics	Science	Indonesian	English
School type (1-private; 2-public)	Overall	0.14	0.11	0.19	0.11
	Java	0.01	-0.06	0.11	-0.10
	West	0.33	0.32	0.29	0.24
	East	0.23	0.22	0.25	0.29
School location (1-remote, 2-rural, 3- small town, 4- large town or city)	Overall	0.14	0.11	0.08	0.18
	Java	0.03	-0.01	-0.02	0.07
	West	0.35	0.20	0.19	0.19
	East	0.26	0.30	0.21	0.39
Kilometres to nearest book shop	Overall	-0.27	-0.23	-0.23	-0.26
	Java	-0.26	-0.21	-0.25	-0.15
	West	-0.24	-0.15	-0.12	-0.23
	East	-0.27	-0.36	-0.31	-0.26
Total number of teachers	Overall	0.18	0.18	0.20	0.21
	Java	-0.01	-0.03	0.03	-0.07
	West	0.34	0.35	0.32	0.38
	East	0.26	0.29	0.28	0.43
Total number of students	Overall	0.28	0.27	0.27	0.26
	Java	0.07	0.09	0.11	-0.01
	West	0.53	0.51	0.49	0.48
	East	0.34	0.31	0.30	0.46
Student-teacher ratio	Overall	0.32	0.30	0.30	0.31
	Java	0.14	0.15	0.18	0.04
	West	0.45	0.43	0.42	0.39
	East	0.22	0.17	0.18	0.30
Hours face-to-face instruction Yr 9 students receive per week	Overall	0.24	0.26	0.27	0.26
	Java	0.18	0.21	0.20	0.17
	West	0.16	0.21	0.22	0.27
	East	0.39	0.36	0.38	0.33
Number of school resources	Overall	0.49	0.45	0.45	0.53
	Java	0.33	0.27	0.28	0.37
	West	0.60	0.58	0.54	0.59
	East	0.51	0.48	0.49	0.59

Note: Apart from coding information provided for specific variables, all variables are coded in such a way that higher codes indicate 'higher' or 'more' than lower codes.

Significant correlations (≥ ±0.17 for overall and ≥ ±0.27 for regions) in bold.

Figure 9.1 Correlates of General School Context and Achievement



The results of the bivariate correlations between general context and the four achievement tests are presented in Table 9.1. General school context is described by several indicators, namely whether an MTs is private or public, whether it is located in a remote or rural area or in or near a small town or a large town or city, its size in terms of numbers of teachers and students and the number of hours of face-to-face instruction Year 9 students receive as well as a measure of school resources. To arrive at this measure, principals had to indicate which of a list of items – ranging from a radio or electricity to internet access and a science laboratory – their school had. Based on this information, a composite variable was created which was the sum of the number of items that a school had according to its principal.

The first two variables, school type and school location showed a small correlation with only one achievement test – Indonesian. Thus, while the positive sign of the coefficient indicates that public MTs (with the higher code '2') perform at a slightly higher level than private MTs (assigned the lower code '1'), this correlation is only significant for Indonesian achievement when considering MTs across the whole of Indonesia.

Differences emerged, however, across the regions in that the association for Java was not different from zero whereas in the West, medium-sized correlations emerged between school type and Mathematics, Science, and Indonesian. In the East, only the correlation with English was significant. Thus, in the West and the East region, the differences in achievement between public and private MTs are larger than they are in Java.

This pattern, whereby achievement differences are greater for the West and East regions than they are for Java was also noted for other general school context variables, namely school location, number of teachers and students and student-teacher ratio. The correlation with all four achievement test scores for location of a school, for instance, is virtually zero, indicating that schools in more remote or rural areas perform at a similar level to schools in or close to small towns or cities. In the West and East, however, the correlation coefficients were larger, albeit only significant for Mathematics in the West and for Science and English in the East.

One could assume that the absence of a relationship in Java might stem from the fact that fewer schools in Java are located in rural or remote areas than in the West or East. The descriptive statistics however, show that this is not the case. Indeed, in the study's sample Java reports the largest number of schools in rural areas compared to the other two regions. Moreover, the proportion of schools that are located in or near small towns or cities is the same (36%) for the East and Java in this study's sample – a simple random sample of schools in each of the three regions.

The other variables with a similar pattern of relationships across the regions show that while larger schools, as indicated by a larger number of teachers and students, perform at a higher level across all subject areas overall, the differences are not significant in Java. In the West and East regions, however, this relationship is pronounced: The larger the school, the higher the achievement in Mathematics, Science, Indonesian and English. This does not mean, however, that larger schools perform at a higher level than smaller schools per se. Rather, it reflects the commonly documented fact that larger schools tend be better equipped and able to offer their students a greater range of educational opportunities than smaller schools (Keeves, 1992; Raudenbush & Willms, 1991).

The positive association between student-teacher ratio and achievement is interesting as it indicates that schools with a higher number of students per teacher perform at a higher level than schools for which a smaller number of students per teacher is recorded. This finding is particularly important given current discussions in Indonesia about the deployment and re-deployment of teachers. For this variable, results of the West stand out in that the correlation coefficients are far larger here than they are in Java and the East for this variable. This indicates a larger importance of the student-teacher ratio regarding achievement in the West than in the other two regions.

The positive overall correlation between the number of instructional hours that Year 9 students receive in MTs per week and achievement, on the other hand, is more obvious: Schools that spend more instructional time teaching students a certain subject record higher levels of achievement than schools who record less instructional time in that subject area.

The final variable indicating the general context of the school that shows a non-trivial correlation with achievement is what ultimately can be considered a – albeit rough – measure of a school's wealth: the number of resources recorded by a school. This variable shows that the largest and most consistent correlation across the four subject areas, both overall and across all regions, indicating the importance of school resources for student achievement.

It might be recalled that schools were not only asked whether or not they had certain elements of school administration and management but data collectors also had to obtain evidence – sometimes in the form of documents, sometimes through observation – to back up those statements. Interestingly, it was the variables indicating the existence or absence of evidence that tended to be related to achievement rather than the schools' self-report measures.

Table 9.2 Correlates of School Administrative Activities and Achievement

		Mathematics	Science	Indonesian	English
Evidence of annual plan (incl. budget and maintenance plan)	Overall	0.30	0.25	0.33	0.28
	Java	0.15	0.14	0.24	0.19
	West	0.37	0.32	0.39	0.24
	East	0.46	0.37	0.45	0.32
Evidence of code of conduct for students	Overall	0.34	0.31	0.29	0.29
	Java	0.37	0.37	0.31	0.31
	West	0.29	0.16	0.23	0.20
	East	0.30	0.23	0.27	0.13
Evidence of code of conduct for teachers	Overall	0.25	0.17	0.20	0.23
	Java	0.26	0.23	0.27	0.30
	West	0.06	-0.08	-0.12	-0.08
	East	0.03	-0.02	0.15	0.01
Evidence of parent-teacher or school committee	Overall	0.23	0.28	0.25	0.15
	Java	0.09	0.12	0.19	0.03
	West	0.25	0.17	0.23	0.11
	East	0.30	0.34	0.24	0.26
Visit by school supervisor	Overall	0.21	0.17	0.13	0.21
	Java	N/A	N/A	N/A	N/A
	West	0.30	0.14	0.06	0.26
	East	0.34	0.34	0.31	0.30

Notes: Apart from coding information provided for specific variables, all variables are coded in such a way that higher codes indicate 'higher' or 'more' than lower codes.

N/A = correlation could not be calculated as all schools in the Java region had been visited by a school supervisor in the previous 12 months.

Figure 9.2 Correlates of School Administrative Activities and Achievement

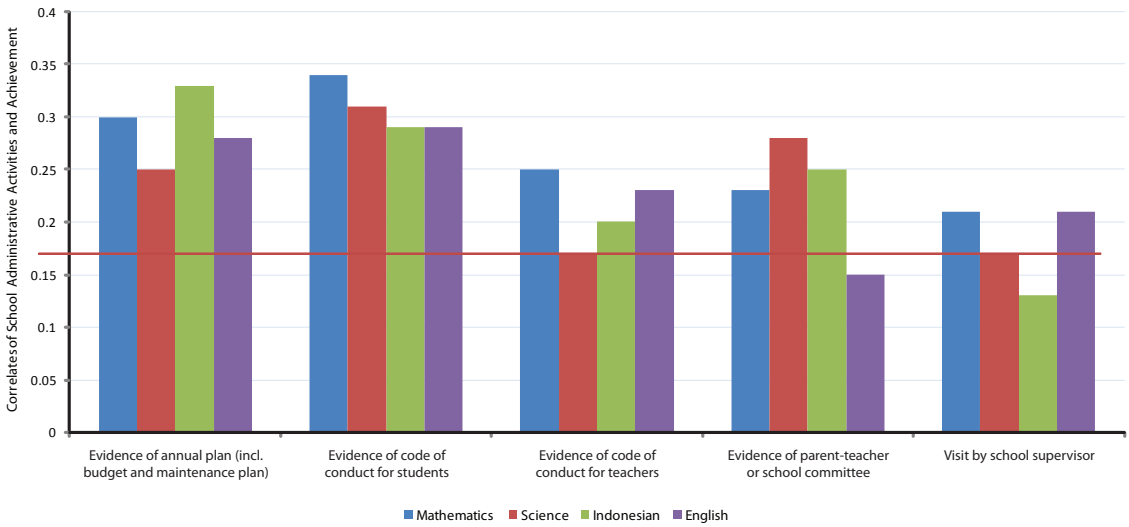


Table 9.2 presents those variables measuring administrative activities that were meaningfully related to achievement. Overall, MTs that provided evidence of an annual plan, including a budget and a maintenance plan, had higher performance in all subject areas than MTs that did not have evidence of such a plan. Regional differences in the strength of the association

indicated again a weaker relationship in Java than in the West and the East. The reverse was true however, with respect to a code of conduct for students and teachers. For this variable, schools in Java displayed stronger relationships with achievement than schools in the East and the West. This difference might reflect a greater need to formalise and make explicit expected behaviours by teachers and students in Java than in the other two regions.

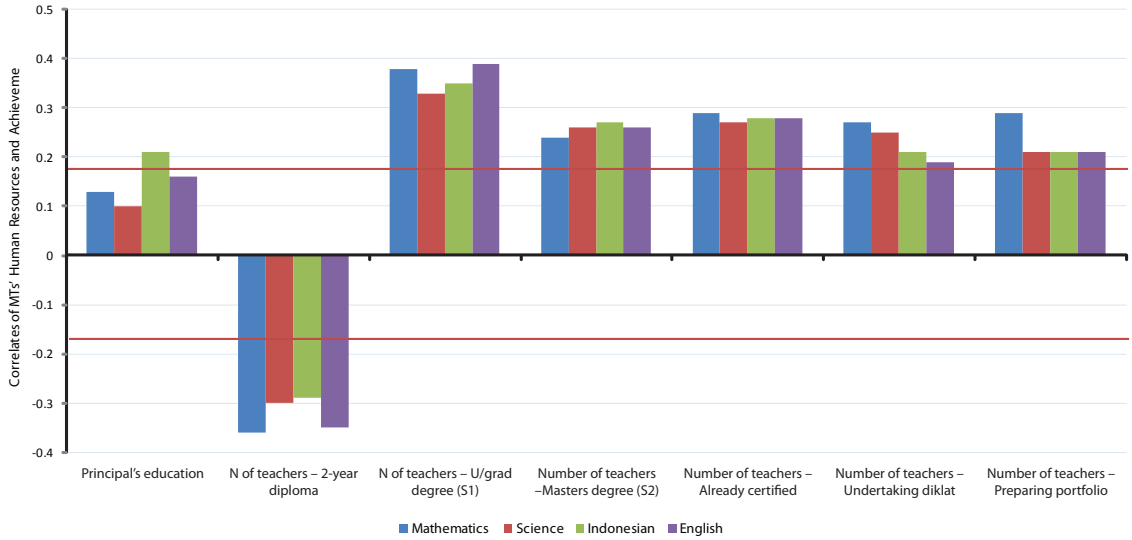
Evidence of a positive relationship between a school having a parent-teacher or school committee and achievement was observed for the East. Unlike in the West, and even less so in Java, schools in the East with a school committee obtained higher achievement levels than schools that did not have evidence of such a committee. Likewise, particularly schools in the East that reported having been visited by a school supervisor recorded higher achievement than schools that had not had such a visit. Correlations could not be computed for Java as all schools had been visited by a supervisor (i.e., there was no variance to correlate).

Table 9.3 Correlates of MTs' Human Resources and Achievement

		Mathematics	Science	Indonesian	English
Principal's education	Overall	0.13	0.10	0.21	0.16
	Java	0.04	-0.03	0.13	-0.02
	West	0.24	0.35	0.34	0.33
	East	0.20	0.12	0.25	0.24
N of teachers – 2-year diploma	Overall	-0.36	-0.30	-0.29	-0.35
	Java	-0.38	-0.35	-0.36	-0.38
	West	-0.37	-0.25	-0.16	-0.25
	East	-0.24	-0.14	-0.22	-0.25
N of teachers – U/grad degree (S1)	Overall	0.38	0.33	0.35	0.39
	Java	0.24	0.17	0.22	0.18
	West	0.53	0.48	0.45	0.53
	East	0.40	0.38	0.38	0.46
Number of teachers – Masters degree (S2)	Overall	0.24	0.26	0.27	0.26
	Java	0.06	0.16	0.16	0.01
	West	0.26	0.33	0.29	0.43
	East	0.30	0.31	0.29	0.34
Number of teachers – Already certified	Overall	0.29	0.27	0.28	0.28
	Java	0.22	0.18	0.18	0.17
	West	0.45	0.36	0.38	0.38
	East	0.38	0.38	0.38	0.43
Number of teachers – Undertaking short course	Overall	0.27	0.25	0.21	0.19
	Java	0.14	0.15	0.18	0.04
	West	0.45	0.43	0.42	0.39
	East	0.22	0.17	0.18	0.30
Number of teachers – Preparing portfolio	Overall	0.29	0.21	0.21	0.21
	Java	0.11	0.04	0.06	-0.01
	West	0.40	0.38	0.36	0.32
	East	0.30	0.31	0.24	0.25

Note: Apart from coding information provided for specific variables, all variables are coded in such a way that higher codes indicate 'higher' or 'more' than lower codes.

Figure 9.3 Correlates of MTs' Human Resources and Achievement



In summary, a number of sizeable correlations were observed between indicators of schools' general context as well as administrative practices whereby a number of relationships were stronger in the East and West than they were in Java. In terms of overall strength, number of school resources had the strongest link with achievement, followed by student-teacher ratio and evidence of a code of conduct for teachers and students.

CORRELATIONS BETWEEN MTs' HUMAN RESOURCES AND ACHIEVEMENT

Table 9.3 summarises the results of the correlation analyses between the educational level of principals and teachers and achievement. With regards to principal's education, it is interesting to note that overall, a significant link with achievement was noted for Indonesian only. When looking at the results by region, it can be seen that the link between principal's level of education was far more pronounced in the West than it was in the East and in Java, where it was virtually zero. Thus, in the West, students at MTs with more highly educated principals performed at a significantly higher level than students at MTs with less well educated principals. The reason for this regional difference is not clear. It might be related to the increase in private tertiary institutions, particularly in Java – many of which do not provide quality training and/or the qualifications are far too easy to obtain. Additional research to tease out this finding in more detail would be useful in the future.

The variables indicating the number of teachers with different levels of education or at different stages of certification in general are positive. In other words, the more teachers a school has with undergraduate or Masters degrees as well as the more teachers it has who are already certified or are undertaking training (i.e., diklat) or preparing a portfolio, the higher a school's achievement in all four subject areas. The only variable for which a negative correlation was recorded was the number of teachers in a school with a 2-year diploma. This probably reflects the fact that where schools have a higher number of teachers with such diplomas – at the expense of teachers with an undergraduate or Masters degree – these school can be considered to be less well equipped in terms of human resources than other schools and ultimately achieve at a lower level.

In addition to variables indicating teachers' level of education and certification, it is important to know what types of teachers' activities are linked to higher achievement. Table 9.4 shows the correlations between some of these variables and achievement. The first relates to whether there is evidence of teachers' lessons plans and whether these contain the objectives of the class. It is interesting to note that, in contrast to many other regional differences reported in this chapter, the relationship was stronger in Java than it was in the West and the East. Indeed, results indicate that MTs that have evidence of teachers' lesson plans and where those contain lesson objectives perform at a significantly higher level than MTs without such plans, applies only in Java and not in the other two regions.

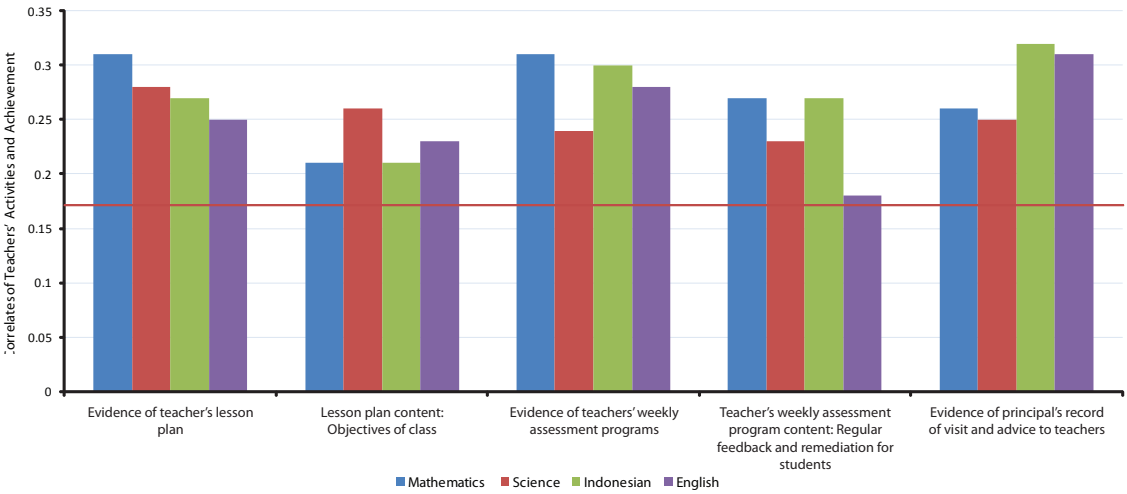
Further, results suggest that schools with teachers who have weekly assessment programs outperform schools without such programs, particularly where these cover regular feedback and remediation for students. This confirms results of a meta-analysis by Hattie (1999) which demonstrated that feedback and suggestions for remediation are among the factors that had the largest beneficial impact on achievement. A useful exercise for the future would be to assess whether teachers actually implement these plans, and if they do, what impact providing feedback and remediation has on student academic performance. Finally, the overall results showed a sizeable correlation between principals' observation of teachers' lessons and subsequent advice. This finding suggests that not only students benefit from feedback about their performance but that teachers do to which is reflected in higher student achievement.

Table 9.4 Correlates of Teachers' Activities and Achievement

		Mathematics	Science	Indonesian	English
Evidence of teacher's lesson plan	Overall	0.31	0.28	0.27	0.25
	Java	0.37	0.41	0.35	0.38
	West	0.16	0.07	0.12	-0.02
	East	0.21	0.07	0.14	0.13
Lesson plan content: Objectives of class	Overall	0.21	0.26	0.21	0.23
	Java	0.28	0.33	0.30	0.30
	West	0.10	0.15	0.07	0.14
	East	0.16	0.22	0.14	0.12
Evidence of teachers' weekly assessment programs	Overall	0.31	0.24	0.30	0.28
	Java	0.39	0.27	0.40	0.33
	West	0.21	0.24	0.22	0.22
	East	0.08	0.01	0.04	0.05
Teacher's weekly assessment program content: Regular feedback and remediation for students	Overall	0.27	0.23	0.27	0.18
	Java	0.19	0.14	0.28	0.05
	West	0.35	0.35	0.29	0.31
	East	0.20	0.17	0.15	0.16
Evidence of principal's record of visit and advice to teachers	Overall	0.26	0.25	0.32	0.31
	Java	0.20	0.18	0.33	0.23
	West	0.32	0.33	0.42	0.40
	East	0.21	0.23	0.12	0.23

Notes: Apart from coding information provided for specific variables, all variables are coded in such a way that higher codes indicate 'higher' or 'more' than lower codes.

Figure 9.4 Correlates of Teachers' Activities and Achievement



CORRELATIONS BETWEEN MTs' PHYSICAL RESOURCES AND ACHIEVEMENT

The final group of variables for which correlation analyses were undertaken relate to schools' physical resources to achievement in the four subject areas (detailed in Table 9.5). Significant correlations with achievement were noted for a separate principal's office, a number of variables describing science laboratories and the general condition of the school building.

Correlations between achievement and whether or not schools have a separate principal's office with a desk were significant only in the West, while in Java they were smaller and in the East virtually non-existent. In contrast, with regards to whether or not a science laboratory is equipped with at least one set of science equipment for demonstration of experiments or a model of a human skeleton, was strongly associated with achievement in the East, whereas it made little difference in the West. It could be thought that this result might stem from differences in the relative frequencies for those variables across regions. This explanation does not hold, however, as similar proportions report (not) having these items in the science laboratory in Java, and in the East with regard to demonstration equipment, and both the West and East for a model of a human skeleton.

The only physical resource variable that was more strongly linked to achievement in Java than in the other two regions was general condition of the school buildings. Thus, in Java, students taught in MTs whose buildings were in better condition performed at a higher level than students in MTs in poorer condition (see Table 9.5 for further information).

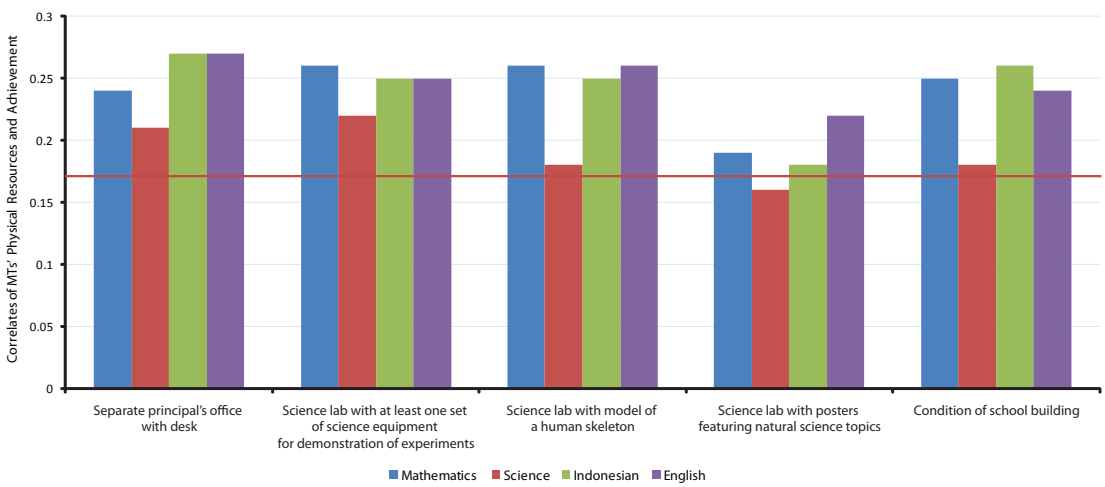
In summary, schools' that had science laboratories equipped with demonstration materials, human skeletons and posters featuring science topics, showed higher achievement in the East. In the West, achievement differences related to variables indicating schools' physical resources emerged only with respect to a separate principal's office with a desk. In Java, the only sizeable correlation was reported between achievement and the condition of the school buildings, whereby students in MTs whose buildings were in better condition performed at a higher level than students in MTs with buildings in poorer condition.

Table 9.5 Correlates of MTs' Physical Resources and Achievement

		Mathematics	Science	Indonesian	English
Separate principal's office with desk	Overall	0.24	0.21	0.27	0.27
	Java	0.15	0.21	0.21	0.20
	West	0.33	0.20	0.34	0.36
	East	0.06	-0.02	0.14	0.07
Science lab with at least one set of science equipment for demonstration of experiments	Overall	0.26	0.22	0.25	0.25
	Java	0.23	0.12	0.25	0.16
	West	0.01	0.07	0.08	0.05
	East	0.40	0.43	0.34	0.49
Science lab with model of a human skeleton	Overall	0.26	0.18	0.25	0.26
	Java	0.24	0.12	0.22	0.25
	West	0.13	0.09	0.15	0.11
	East	0.29	0.26	0.33	0.30
Science lab with posters featuring natural science topics	Overall	0.19	0.16	0.18	0.22
	Java	0.03	-0.02	0.01	0.01
	West	0.26	0.26	0.27	0.29
	East	0.25	0.23	0.32	0.39
Condition of school building	Overall	0.25	0.18	0.26	0.24
	Java	0.30	0.20	0.29	0.28
	West	0.19	0.20	0.21	0.23
	East	0.09	0.06	0.15	0.14

Notes: Apart from coding information provided for specific variables, all variables are coded in such a way that higher codes indicate 'higher' or 'more' than lower codes.

Figure 9.5 Correlates of MTs' Physical Resources and Achievement



SCHOOL-LEVEL VARIABLES NOT LINKED TO ACHIEVEMENT

Finally, the following variables for which information was collected in the principal interview and the school inventory did not show sizeable correlations with any of the achievement scores:

- Principal: Specialised training in school management, experience in teaching and managing a school, whether or not s/he is teaching;
- Proximity to nearest health centre or market place;
- Monitoring of student and teacher attendance;
- Evidence of a school's organisational structure or reporting school statistics to central body;
- Number of days school is open;
- Importance of different stakeholders (e.g., MoRA, religious leader (imam), Foundation) in making decisions regarding the employment of teachers, curriculum taught at school and for how much time;
- Reporting of assessment results to parents and principal by teachers; and
- School library and the borrowing of books. This was an unexpected finding. Perhaps an additional study could be undertaken to investigate: the concept of a library, as well as the quality of resources and how they are used at the school-level.

MORE ON THE RELATIONSHIP BETWEEN SCHOOL SIZE AND ACHIEVEMENT

At a workshop to discuss preliminary results of the current project, the correlation between school size and achievement attracted much interest. The correlation was positive indicating that students in larger MTs were performing at a higher level in the various subjects than students in smaller MTs.

Those bivariate correlations between student and school context variables and achievement, however, can only provide first indications of which of the many variables for which information was collected during the project were related to achievement and which variables were not.

As a next step, multivariate analytical techniques were applied in order to examine the effects of variables while controlling for the effects of others. This was done by including those variables that had been identified as being related to achievement in the Hierarchical Linear Modelling (HLM) analyses (see Chapter 10). The interested reader is encouraged to turn to the results described in Chapter 10 to get an idea of how strong, for example, the effect of the preparation of teachers' lessons plans is on Mathematics achievement after students' home background and attitudes towards school have been taken into account (in a sense the "net" effect).

However, given the interest in the relationship between school size and achievement, the following additional multiple regression analyses were undertaken and are presented below.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistic				
					R Square Change	F Change	df1	df2	Sig. F Change
1	,352[a]	.124	.118	3.14753	.124	20.919	1	148	.000
2	,534[b]	.285	.276	2.85212	.162	33.246	1	147	.000

a. Predictors: (Constant), Total number of Students

b. Predictors: (Constant), Total number of Students. Number of school possessions.

In addition to school size, number of school resources[3] was also found to have a positive correlation with achievement, indicating that students in schools with more resources outperformed students in schools with fewer resources. As much previous research has indicated that it is not school size per se that is linked to higher achievement, but the greater resources that larger schools usually attract, a multiple block wise regression analysis was undertaken entering school size (total number of students in school) in the first block ("Model 1") and number of home resources in the second block as predictors of Mathematics achievement ("Model 2"). The results are presented below.

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	11.800	.368		30.569	.000		
Total number of students	.007	.002	.352	4.574	.000	1.000	1.000
(Constant)	8.464	.676		12.520	.000		
Total number of students	.003	.002	.140	1.771	.079	.782	1.279
Number of school possessions	.363	.063	.455	5.766	.000	.782	1.279

a. Dependent Variable: raw_maths_mean

As can be seen in the first row above ("Model 1"), when only school size predicts Mathematics achievement, the adjusted R^2 is 0.11 indicating that 11 percent of the variance in Mathematics achievement between schools can be explained by school size. The adjusted R^2 is 0.28 indicating that both predictors explain 28 percent of the variance between schools.

Inspection of the table below, however, clearly demonstrates which of the two variables is responsible for the effect. When only school size is included as a predictor ("Model 1"), its effect on achievement is significant (β=0.35; p=.00). However, examination of the second line in the table ("Model 2) reveals that when the two predictors are considered simultaneously, only number of school resources (β=0.46; p=.00) remains significant whereas the effect of total number of students on achievement turns out to be trivial (β=0.14; p=.08).

[3] This is a count of the number of following items a school possesses: science lab, school hall, staff room, separate principal's office, store room separate from principal's office, first aid kit, sports area/playground, piped water, electricity, landline telephone, fax machine, typewriter, radio, tape recorder, overhead projector, television, VCR, DVD player, photocopier, computer, internet access, fence or hedge around school borders, canteen.

In other words, once the effect of number of school resources is taken into account, school size ceases to be significant[4].

Further, as much of the difference in achievement has been shown to be a consequence of differences in students' homes, it was considered of interest to examine the extent to which the number of school resources would continue to have a significant effect on achievement after students' home background was taken into account. To explore this issue, a further multiple regression analysis was undertaken including total number of school resources and students'home background[5] . The results are provided below.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistic				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.520[a]	.270	.266	2.87262	.270	54.797	1	148	.000
2	.605[b]	.365	.357	2.68768	.095	22.068	1	147	.000

a. Predictors: (Constant), Number of school possessions

b. Predictors: (Constant), Number of school possessions, HomeBack_mean

The table above shows that while number of school resources accounts for 27 percent of the variance, home background adds another 10 percent to the explained variables (both in the column "R Square change").

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	8.394	.680		12.349	.000		
Number of school possesions	.415	.056	.520	7.403	.000	1.000	1.000
(Constant)	9.721	.696		13.969	.000		
Number of school possessions	.306	.057	.383	5.339	.000	.837	1.195
HomeBack_mean	1.788	.381	.337	4.698	.000	.837	1.195

a. Dependent Variable: raw_maths_mean

The table above shows, in this instance, both predictors have a separately identifiable and significant effect on Mathematics achievement. The standardised betas show that while number of school resources (β=0.38; p=.00) has a larger effect than home background (β=0.34; p=.00) both predictors have a significant effect on Mathematics achievement. This means that number of school resources has a significant effect on achievement even after differences between schools in terms of the background of students have been taken into account.

[4] That none of the effects discussed here are a consequence of multicollinearity between predictor can be seen in the "Collinearity Statistics" column as only values for the Tolerance of <0.10 and > 10 for the VIF (Variance inflation factor) would be considered to indicate potential problems.

[5] This is a factor score school based on highest level of education of either parent; number of home resources, number of books at home, aggregated to reflect the mean value for each of the 150 schools in the study.

In summary, these further results illustrate that it is not school size per se which has an effect on student achievement. Rather, the greater resources available to larger schools carry through this effect. Moreover, number of school resources has a positive effect on achievement even after the wealth and educational context of student's home background has been taken into account. Therefore, efforts should be aimed at improving the level of resources available to smaller schools in order to increase student performance in those schools.

SUMMARY

In this chapter, the relationships between school-level variables and student achievement were examined. Results included the following:

- With respect to schools' general context and administrative practices, number of school resources had the strongest link with achievement, indicating higher achievement by schools with more resources. School size was also consistently linked to achievement in all regions with larger schools showing higher performance in all subject areas, probably reflecting the greater number of educational opportunities that larger schools can offer their students.
- Unlike in the East and Java where this relationship was not significant, schools in the West with more highly educated principals performed at a significantly higher level than schools with less well educated principals.
- In general, schools with more highly qualified teachers performed at a higher level than other schools. This link was particularly strong for the number of teachers with an undergraduate degree and in the East and the West.
- Teachers' activities mainly make a difference to achievement in Java. Here, students of teachers who had lesson plans outlining the objectives of the class as well as weekly assessment programs performed at a higher level than students taught by teachers without such plans and programs.
- In the West, regular feedback to students based on their assessment and principals' visits to and feedback of lessons were related to higher achievement.
- In terms of schools physical equipment, regional differences also prevailed. Thus, schools' that have science laboratories with demonstration materials, human skeletons and posters featuring science topics showed higher achievement in the East. In the West, achievement differences relate to a separate principal's office with a desk. In Java, the condition of the school buildings was important in that students in schools whose buildings are in better condition performed at a higher level than students in schools with buildings in poorer condition.
- Once the effect of number of school resources was taken into account, school size was not significant to level of achievement.
- It is not school size which has an effect on student achievement. Rather, the greater resources available to larger schools carry through this effect.
- Number of school resources had a positive effect on achievement even after the wealth and educational context of student's home background had been taken into account.

► Photo: Marbawi

10 TOWARDS AN UNDERSTANDING OF DIFFERENCES IN ACHIEVEMENT IN MTs

10. TOWARDS AN UNDERSTANDING OF DIFFERENCES IN ACHIEVEMENT IN MTs

Bivariate correlation analyses, such as the ones reported in the previous two chapters, go some way in highlighting the variables associated with differences in academic achievement between students and schools. However, more sophisticated analyses are required which reflect the more complex relationships between variables in educational settings where many different factors operate to ultimately affect achievement. The complexity of such analyses stems from the fact that contextual information, for example about students' home environment, their attitudes and expectations, and teacher- and school-related factors, need to be taken into account at the appropriate levels in order to understand what leads to differences in performance within and across schools.

'Appropriate levels' here means that variables should be analysed at the level at which they operate: While home background operates at the student-level, instructional or administrative matters operate at the class or school-level. Traditional models of multiple regression analyses can examine the relationship between variables at only one level at a time. This means that either only student variables or only school variables may be related to each other and achievement. Alternatively, student variables need to be aggregated to the school-level or school variables need to be disaggregated to the student-level in order to be analysed in one multiple regression model. In both cases, the analysis does not reflect the nested structure of formal education where students are nested within classes, classes nested within schools, schools within districts and so on. Moreover, misleading conclusions are likely to be drawn as a result of applying principles of testing for statistical significance which tend to be based on simple random samples and do not take into account the clustered nature of a sample such as the one in this study – and many other large-scale international studies – where schools are sampled first, followed by some form of student sample within schools.

Multilevel modelling as a way to overcome these limitations was used to examine the way in which student- and school- level factors operate to explain differences in achievement (Goldstein, 2003; Raudenbush & Bryk, 2002). More specifically, student- and school-level variables that emerged in the correlation analyses to have meaningful links with English achievement were entered into a two-level hierarchical linear model which was then analysed using the Hierarchical Linear Modelling (HLM)software (HLM-6; Raudenbush, Bryk, Cheong, Congdon & duToit, 2004).

In order to keep the amount of information manageable and still arrive at an in-depth understanding of how various factors at the two levels operate, two achievement areas, English and Mathematics, were selected to illustrate the type of conclusions that can be drawn from such analyses. The reasons for choosing these two areas are twofold: First, they were the two more reliable measures of achievement tested in the current study. That is, the psychometric properties of the English and Mathematics tests were superior to those of the Science and Indonesian tests, and they were better able to distinguish between low and high performing students than were the Science and Indonesian tests. Second, whereas student-level variables showed consistently higher correlations with English achievement, school-level variables displayed consistently higher correlations with Mathematics achievement. Thus, it will be of interest to ascertain the explanatory power of the same variables for the two subject areas.

Finally, it should be noted that the analyses were undertaken for MTs overall, that is across the 150 schools – rather than for each region separately – in order to maintain a sufficient level of power to identify significant effects. Region was included as a variable since the previous analyses had revealed differences across regions, especially between Java when compared with the East and the West.

VARIABLES IN THE HIERARCHICAL LINEAR MODELLING ANALYSES

The variables considered for inclusion in the HLM analyses are listed in Table 10.1 below. These variables were selected as the earlier correlation analyses showed them to be significantly related to achievement.

While it would have been desirable to include all school-level variables listed in Table 10.1 in the HLM analyses, a number of them had substantial missing data. For example, information on principals' visits to classes and advice and feedback to teachers had information missing from 38 of the 150 MTs. In addition, whether or not MTs had an annual plan was missing for 19 MTs, while information regarding a code of conduct for students was missing for 16, and information on the distance to the nearest bookshop was missing for 9 MTs. HLM is unable to deal with missing data at level 2; it drops those schools along with the corresponding students in the analyses. As different schools had missing data on different variables, an initial inspection of the data revealed that more than 50 schools would have been dropped from the analyses if all school-level variables were retained. Therefore, it was decided to drop these variables from the analyses.

Table 10.1 Student and School-Level Variables Considered for Inclusion in the HLM Analyses

Student-level variables	School-level variables
Gender	Region
Age	Kilometres to nearest book shop
Grade repetition	Total number of students
Home background [a)]	Hours per week face-to-face instruction Year 9 students
Expected education	Number of school resources [c)]
Frequency with which homework assigned	Annual plan (incl. budget and maintenance plan)
Availability of textbook	Code of conduct for students
Negative attitude to school [b)]	Number of teachers with undergraduate degree
Achievement	Teachers have lesson plans
	Teachers' weekly assessment plans include feedback and remediation for students
	Principal visits classes and give feedback and advice to teachers

Notes:

[a)] *Factor score based on highest level of education of either parent; number of home resources, number of books at home.*

[b)] *Score based on responses to the items "school is a place where..." "I feel depressed", "I feel restless", "I feel lonely", "I get upset", "I feel worried". The reason for selecting this scale rather than the positive attitude to school scale was the higher correlation of the negative scale with achievement.*

[c)] *Count of the number of following items a school possesses: science lab, school hall, staff room, separate principal's office, store room separate from principal's office, first aid kit, sports area/playground, piped water, electricity, landline telephone, fax machine, typewriter, radio, tape recorder, overhead projector, television, VCR, DVD player, photocopier, computer, internet access, fence or hedge around school borders, canteen.*

Table 10.2 provides details on the variables that were finally included in the HLM analyses. Of particular interest for the interpretation of results is the last column which provides explanations regarding the coding and meaning of variables in the analyses.

As any variable included in an HLM model has to be either continuous or dichotomous (Raudenbush et al., 2004), all variables that were originally ordinal in nature (e.g., expected education which had 6 categories), was re-coded into "dummy variables" (i.e., a variable with the value of either '0' or '1').

The HLM analyses were then undertaken in the following steps. First, a so-called "fully unconditional" model was estimated to arrive at estimates of how much variance was associated with each level. Then, the student-level variables listed in Table 10.2 were entered at level 1 as predictors of achievement. The model was subsequently refined based on interim results whereby any student-level predictor with a non-significant effect on achievement (i.e., p. >0.05) was considered to be not sufficiently substantive and removed from the model. The least significant predictors were removed first until only significant effects remained. The same process was followed with the school-level variables. In this way, a final model was obtained with only significant predictors of achievement retained at the student- and the school-level. Results of the analyses are reported below.

Table 10.2 Descriptive Statistics of Student (level 1) and School (level 2) Variables in the HLM Analyses

Variable	N	Mean	SD	Min	Max
Level 1 – Student-level variables					
Score on mathematics test	5905	13.81	5.44	2.00	30.00
Score on English test	6019	16.95	6.15	2.00	30.00
Home background factor score [a)]	5449	0.00	1.00	-2.33	3.67
Negative attitude to school score	6018	8.52	2.39	4.00	19.00
Gender [b)]	5884	0.53	0.50	0.00	1.00
Number of home resources	5900	6.52	2.99	0.00	16.00
Grade repetition [c)]	5864	0.13	0.34	0.00	1.00
Mathematics homework	5758	0.48	0.50	0.00	1.00
English homework	5775	0.52	0.50	0.00	1.00
Maths textbook [d)]	5899	0.65	0.48	0.00	1.00
English textbook [d)]	5899	0.63	0.48	0.00	1.00
Expected education [e)]	5866	0.76	0.43	0.00	1.00
Age [f)]	5876	0.10	0.30	0.00	1.00
Level 2 – School-level variables					
Number of teachers with undergraduate degree	145	13.76	9.48	0.00	56.00
Student enrolment	145	186.81	166.61	19.00	1062.00
Number of hours of instruction	145	29.34	4.45	12.00	40.00
Number of school resources	145	11.47	4.21	1.00	21.00
Evidence of teachers' lesson plans	145	0.93	0.25	0.00	1.00
Evidence of teachers' weekly assessment plans [g)]	145	0.43	0.50	0.00	1.00
Region	145	0.34	0.48	0.00	1.00

Notes:

a) *The higher the score the wealthier the home*
b) *0 equals boy; 1 equals girl*
c) *0 equals no grade repetition; 1 equals at least one grade has been repeated*
d) *0 equals no textbook; 1 equals yes they have the textbook*
e) *0 equals student expects to finish Year 12; 1 equals student expects to obtain a tertiary qualification*
f) *0 equals 15 years or less; 1 equals greater than 15 years*
g) *Assessment plan must have included feedback and remediation for students*
h) *0 equals East and West regions; 1 equals Java*

RESULTS OF THE HLM ANALYSES

Results of the HLM analyses are presented in two parts. The first part focuses on how much variance in achievement is associated with the student-level factors on the one hand and with the school-level factors on the other hand. Estimates of the proportions of the variance associated with each level are available when analysing a fully unconditional HLM model – one without any predictors at either the student- or school- level. Results indicate what proportion of the variance is due to differences between students and what proportion is due to differences between schools. As educational policy makers can more easily influence schools, the proportion of variance between schools tends to be of greater concern than the variance between students. In the second part, results of the analyses are presented as to which factors explain differences in achievement, first for Mathematics and then for English.

VARIANCE BETWEEN STUDENTS, BETWEEN SCHOOLS AND VARIANCE EXPLAINED AT EACH LEVEL

Results of the analyses estimating the amount of difference between students within schools and the difference between schools are presented in Table 10.3. It can be seen that 64 percent of the differences in Mathematics were between students within schools whereas 36 percent was related to differences between schools. This finding is similar to the 2006 results for Indonesia in the PISA (OECD 2007, Table 4.1g), where 33 percent of the variance in Mathematics performance was reported to occur between schools. This compares with an average between-school variance in Mathematics performance of 36.8 percent for OECD countries and 40 percent for non-OECD countries participating in PISA (OECD 2007). For the two countries also participating in PISA which neighbour Indonesia: Australia and Thailand, the corresponding figures are 19.8 percent for Australia and 29.8 percent for Thailand. Thus, while the differences in Mathematics achievement between MTs are slightly smaller than the differences between schools for the average OECD and non-OECD country, they are larger than in these two neighbouring countries.

In English, differences between schools were even greater as indicated by the fact that 42 percent of the differences in achievement can be attributed to schools while 58 percent can be attributed to students. This means that differences between MTs are greater in English than they are in Mathematics. Unfortunately, no internationally comparative data are available since none of the main international assessment programs undertaken by the OECD or the IEA include the assessment of English as a foreign language.

The other information provided in Table 10.3 is the amount of variance at each level that is explained by the final model. That is, the table provides information on how much of the differences between students within schools and between MTs is accounted for by the variables that had a significant effect on achievement. The table shows that the factors in the final model – which will be explained in detail in the following two sections – explained 43 percent of the differences between MTs in Mathematics achievement while they explained 40 percent of the differences between MTs in English achievement. Between students within schools, in contrast, only 5 percent of differences in Mathematics and 10 percent of the differences in English performance were explained by the factors in the model. Thus, a large amount of variance at the student level remains unexplained.

Table 10.3 Variance Between Students, Between Schools and Variance Explained**

	Students (N=6071)	Schools (N=145*)
Mathematics		
Variance associated with level	64%	36%
Variance explained by final model	5%	43%
English		
Variance associated with level	58%	42%
Variance explained by final model	10%	40%

Note:
**Five schools had missing information on whether or not teachers had lesson plans which is why they were dropped from the analyses resulting also in the slightly reduced number of students.*
***For details regarding the calculations in this table, please refer to Appendix B.*

RESULTS FOR MATHEMATICS

Table 10.4 Final Estimation of Fixed Effects for Mathematics Achievement

Effect	Coeff.	SE	T-ratio	App. df	*p*-value
At the school level					
For intercept	13.39	0.21	65.19	140	0.00
Number of school resources	0.19	0.06	3.02	140	0.00
Evidence of teachers' lesson plans	2.13	0.56	3.81	140	0.00
Evidence of teachers' weekly assessment plans	1.08	0.50	2.16	140	0.03
Region [a)]	2.18	0.49	4.46	140	0.00
At the student level					
Home background factor score [b)]	0.81	0.13	6.41	5309	0.00
Negative attitude to school score	-0.21	0.04	-5.85	5309	0.00
Expected education c)	0.85	0.22	3.81	5309	0.00
Age [d)]	-0.70	0.30	-2.35	5309	0.02
Grade repetition [e)]	-1.03	0.21	-4.79	5309	0.00

Notes: SE-Standard error ; df = Degrees of freedom

a) 0 equals East and West regions; 1 equals Java

b) The higher the score, the wealthier the home

c) 0 equals student expects to finish Year 12; 1 equals student expects to obtain a tertiary qualification

d) 0 equals 15 years or less; 1 equals greater than 15 years

e) 0 equals no grade repetition; 1 equals at least one grade has been repeated

Results of the final two-level HLM analysis for Mathematics achievement are given in Table 10.4. The first noteworthy result is that, at the school-level, number of school resources, whether or not teachers prepare lesson plans and include feedback and remediation suggestions for students in their weekly assessment plans as well as region, all have a significant effect on achievement. Thus, students in MTs in Java with a larger number of resources and teachers who prepare lesson plans and weekly assessment plans perform at a higher level in Mathematics than students in MTs in the East or West with fewer resources and where teachers do not prepare lesson plans or weekly assessment programs.

The coefficients in the second column provide further details regarding these differences. For instance, while the average Mathematics score for a student was 13.39 (the value for the intercept), a student in Java will achieve an average score of 15.57 (13.39 + the effect for 'Region' of 2.18). If this student is taught in a school where teachers can provide evidence of their lesson plans, this adds another 2.13 (the coefficient for 'Evidence of teachers' lesson plans') to his or her score.

At the student-level, results indicate that students from homes with more highly educated parents and a greater number of resources ('Home background factor score'=0.81), who are up to 15 years of age ('Age'=-0.70), have not repeated a class ('Grade repetition'=-1.03) and with lesser feelings of depression, restlessness and worry when being at school ('Negative attitude to school score'=-0.21) perform at a higher level than their peers.

RESULTS FOR ENGLISH

Table 10.5 Final Estimation of Fixed Effects for English Achievement

Effect	Coeff.	SE	T-ratio	App. df	p-value
At the school level					
For intercept	16.52	0.27	60.10	142	0.00
Number of school resources	0.35	0.07	4.73	142	0.00
Region [a)]	1.81	0.60	3.00	142	0.00
At the student level					
Home background factor score [b)]	0.84	0.12	7.23	5308	0.00
Negative attitude to school score	-0.27	0.04	-7.81	5308	0.00
Gender [c)]	1.61	0.20	8.27	5308	0.00
Expected education [d)]	0.52	0.23	2.28	5308	0.02
Age [e)]	-0.74	0.31	-2.37	5308	0.02
Grade repetition [f)]	-1.47	0.23	-6.39	5308	0.00

Notes: SE-Standard error; App df = Degrees of freedom

a) 0 equals East and West regions; 1 equals Java

b) The higher the score, the wealthier the home

c) 0 equals boy; 1 equals girl

d) 0 equals student expects to finish Year 12; 1 equals student expects to obtain a tertiary qualification

e) 0 equals 15 years or less; 1 equals greater than 15 years

f) 0 equals no grade repetition; 1 equals at least one grade has been repeated

The results for the analysis of the final HLM model for English are presented in Table 10.5. At the school-level, only two variables remain to have a significant effect on achievement, namely the number of school resources (0.35) and the region in which the school is located (1.81; t-value 3.00). It is interesting to note that compared to the final model in Mathematics, the region in which an MT is located makes less of a difference for English than it does for Mathematics (2.18; t-value 4.46). That is, differences across MTs in achievement between Java – where schools performed at a higher level – compared to the East and West regions are smaller for English than they are for Mathematics.

At the student-level, as was the case in Mathematics, home background, expected education, negative perception of school life, age and grade repetition have a significant effect on English performance. In addition, gender emerges as having a significant effect whereby girls perform at a significantly higher level than boys. Indeed, the effect associated with gender is the largest effect at the student-level.

SUMMARY

In this chapter, those student and school variables that had been shown earlier to be related to Mathematics achievement were examined in a multilevel model by way of hierarchical linear analysis. It should be remembered that as a consequence of analysing the variables in the same model, any effect of a variable on achievement is taken into account with the effect of any other variable in the model. This means that, for example, in schools where teachers prepare lesson plans, students perform at a higher level in Mathematics even after the positive effect of more highly educated parents and a home with more resources has been taken into account. With this in mind, the major results of the HLM analyses may be summarised as follows:

- 36% of the differences in Mathematics achievement are related to differences between MTs. Corresponding figures from PISA 2006 are 33% for Indonesia, 29.8% for Thailand and 19.8% for Australia. Thus, differences in Mathematics achievement due to differences between schools are slightly larger in MTs than they are for Indonesia overall, in Thailand and in Australia.
- Factors that account for differences in Mathematics achievement between MTs are, in descending order of significance: Whether or not MTs are located in Java, whether or not teachers prepare a lesson plan, number of school resources and whether or not teachers' weekly assessment plans include feedback and remediation suggestions for students.
- Differences between MTs are even greater in English than they are in Mathematics.
- Factors that explain differences in English achievement between MTs are the number of school resources and the region in which MTs are located.
- Factors that explain differences between students within schools in achievement for both English and Mathematics include home background, expected education, age, grade repetition and perceptions of quality of school life. Thus, students whose parents are more highly educated, who have access to more resources at home, who expect to go to university, who are of Year 9 appropriate age (i.e. not older than 15 years) and who do not feel restless, worried, upset, lonely or depressed at school perform at a higher level in Mathematics and English than their peers.
- Gender differences emerge for English only, with girls performing at a significantly higher level than boys.
- A number of variables originally included in the analyses failed to have significant effects on achievement, after all other significant effects were taken into account. At the student-level, these were frequency of homework and whether or not students have a textbook. At the school-level, these were number of teachers with undergraduate qualifications, number of students and hours per week of face-to-face teaching of Year 9 students.

► Photo: Marbawi

11 POLICY IMPLICATIONS AND SUGGESTIONS

11. POLICY IMPLICATIONS AND SUGGESTIONS

This final chapter briefly details some of the policy implications and suggestions for additional work stemming from the findings of the QEM project. The list is not exhaustive by any means, but it provides MoRA and other stakeholders with options to consider for further understanding and improving the quality of madrasah education in Indonesia.

ONGOING PROFESSIONAL DEVELOPMENT OF IN-SERVICE TEACHERS

One of the main findings of the QEM study was the importance of teacher practices to levels of student achievement. Teachers' qualification and certification levels were found to be significantly correlated with student achievement. With regard to certification, it was interesting to note that the process of achieving certification itself, linked to professional development workshops and preparation of professional portfolios, were also correlated with achievement. This is a particularly positive finding given the large investment the Government of Indonesia has made to certify 2.7 million teachers by 2015.

Other areas of teacher practice which correlated with achievement were teachers' lesson plans and assessment plans, and principals' monitoring of teaching practices. The findings of the more sophisticated HLM analysis in Chapter 10 showed that teachers' feedback and remediation plans were still linked to achievement, even after student and school background factors were taken into account.

The current study, however, showed that these characteristics and activities are not widespread among MTs. For example, at the national level there is a ratio of 80 students to every certified teacher at a school, and only approximately 41 percent of teachers include regular feedback and remediation as part of their assessment plan.

Given these findings, it is suggested that:

- Manuals and training workshops for teachers ought to be developed which explain the importance of teacher behaviour on student achievement.
- Teachers undergo professional development, where they will be supplied with accurate information about how to develop and implement good lesson plans, weekly assessment plans, and feedback and remediation strategies for students.

PROVISION OF ADEQUATE FACILITIES AT MADRASAH

The initial regression findings showed that school size was significantly related to student achievement. However, more sophisticated analyses using HLM showed that it is not school size per se which has an effect on student achievement. Rather, the greater resources available to larger schools are of particular importance. Moreover, number of school resources has a positive effect on achievement even after the wealth and educational context of student's home has been taken into account.

Together, these findings suggest that:

- Efforts ought to be aimed at improving the level of resources available to smaller schools in order to increase student performance in those schools.
- Efforts should be aimed at increasing the number of school resources across less well equipped MTs in order to increase student performance in those schools.

OTHER SUGGESTIONS

- Given that over 65 percent of MTs students expect to complete a post-secondary qualification, the madrasah education system must adequately prepare its students for the level and types of scientific analysis, problem-solving, reading comprehension and writing skills, expected of attendees of tertiary education programs.
- Efforts should focus on MTs in the East and the West region as they lag behind Java in achievement in both Mathematics and English.
- Some efforts should be directed at fostering boys' performance in English. However, only reading comprehension was assessed in the English test. Written and spoken English and listening skills were not included in the testing regime, but ideally would be assessed before any English enhancement program for boys was developed.
- Undertake additional projects to further understand the madrasah student population and how student achievement is related to various factors. Four suggestions are provided below:
  1. The study showed that MTs with teachers who have weekly assessment programs outperform MTs without such programs, particularly where these cover regular feedback and remediation for students. A useful exercise for the future would be to assess whether teachers actually implement these plans, and if they do, what impact providing feedback and remediation has on student academic performance.
  2. The overall results of the current study showed a sizeable correlation between principals' observation of teachers' lessons and subsequent advice. This is an interesting area for future work.

3. Many Indonesian parents pay for their children to undertake additional tutorials. However, the current study revealed that such tutorials have little impact on improving student performance. Future work ought to be undertaken in the area before parents or schools make any decisions about removing their child from tutorials.
4. Results by region showed that absenteeism is slightly lower in the East than in Java and the West. A study could be undertaken to more clearly understand the reasons behind student absences from school.

REFERENCES

Ainley, J., Reed, R., & Miller, H. (1986). *School organisation and the quality of schooling: A study of Victorian Government secondary schools*. (ACER Research Monograph No. 29). Hawthorn, Victoria: ACER.

Ainley, J. & Sheret, M. (1992). *Progress through high school: A study of senior secondary schooling in New South Wales*. (ACER Research Monograph No. 43). Hawthorn, Victoria: ACER.

Andrabi, T., Das, J., Khwaja, A.I., & Zajonc, T. (2005) "Religious school enrollment in Pakistan: A look at the aata", *World Bank Working Paper Series no.3521*. Available at: http://www-wds.worldbank.org/external/default/WDSContentServer/IW3P/IB/2005/02/28/000112742_20050228152509/Rendered/PDF/wps3521.pdf

Asadullah, M.N, Chaudhury, N., and Dar, A., 2006, "Student Achievement Conditioned Upon School Selection: Religious and Secular Secondary School Quality in Bangladesh", *World Bank Working Paper Number 140*.

Australia Indonesia Partnership (May 2010). *Aspirations and destinations: Senior secondary school graduates in Eastern Indonesia pre- and post-graduation*. Author.

Boyd, S., McDowall, S. & Cooper, G. (2002). *Innovative Pathways: The Case Studies, Phase 1 Report*, Wellington: NZCER. Available at: http://www.nzcer.org.nz/pdfs/11720.pdf

Cohen, J. (1992). A Power Primer. *Psychological Bulletin*, 112(1), 155-159.

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences* (2nd ed.). Mahwah, N.J.: Lawrence Erlbaum Associates.

Goldstein, H. (2003). *Multilevel statistical models. Third edition*. London: Edward Arnold.

Hattie, J. (1999). *Influences on student learning. Inaugural lecture*, University of Auckland. Accessed 18/01/2010 at: http://www.education.auckland.ac.nz/uoa/home/about/staff/j.hattie/hattie-papers-download/influences

Hungi, N. & Postlethwaite, N. T. (2009). The key factors affecting grade 5 achievement in Laos: Emerging policy issues. *Education Research Policy and Practice*, 8, 211-230.

Jiyono & Suryadi, A. (1982). The planning, sampling and some preliminary results of the Indonesian repeat 9th grade survey. *Evaluation in Education*, 6 (1), 5-30.

Keeves, J. (1992). *The IEA study of science III. Changes in science education and achievement*. Oxford: Pergamon.

Kong, C-K. (2008). Classroom learning experiences and students' perceptions of quality of school life. *Learning Environments Research*, 11, 111-129.

Kos, J., Nugroho, D. & Lietz, P. (July 2009). *Quality of education in madrasah: Phase one – Findings from pilot study one*. Submitted by the Australian Council for Educational Research (ACER) to Contractor Strategic Advisory Services (CSAS).

Lietz, P. Nugroho, D. (July 2009). *Quality of education in madrasah (QEM): Phase two – Summary of findings from pilot study two in August 2009*. Submitted by the Australian Council for Educational Research (ACER) to Contractor Strategic Advisory Services (CSAS).

Lietz, P. (2006). A meta-analysis of gender differences in reading achievement at the secondary school level. *Studies in Educational Evaluation*, 32(4), 317-344.

Mangindaan, C., Sembiring, R. K. & Livingstone, I. D. (1978). *National Assessment of the Quality of Indonesian Education: Survey of Achievement in Grade 9* (Jakarta: BP3K).

Marks, G. (1998). *Attitudes to school life: Their Influences and their effects on achievement and leaving school. LSAY Research Reports*. Longitudinal surveys of Australian youth research report ; n.5. Available at: http://research.acer.edu.au/lsay_research/62

Matters, G. (2008). *The National Examinations Synthesis Paper*. Submitted by the Australian Council for Educational Research (ACER) to Contractor Strategic Advisory Services (CSAS).

Ministry of Religious Affairs, Madrasah Education Directorate (2003), *Madrasah education sub-sector assessment*. Dr Muljani A Nurhadi (Team Leader). Jakarta: Madrasah Aliyah Development Project.

Moegiadi, Mangindaan, C., & Elley, W.B. (1979). Evaluation of Achievement in the Indonesian Education System. *Evaluation in Education: International Progress 2, no. 4*, 281-351.

Mok, M. & Flynn, M. (2002). Determinants of students' quality of school life: A path model. *Learning Environments Research*, 5, 275-300.

Neuschmidt, O., Barth, J., & Hastedt, D. (2008). Trends in Gender Differences in Mathematics and Science (TIMSS 1995 – 2003). *Studies in Educational Evaluation, 34*(2), 56-72.

Newhouse, D. & Beegle, K. (2005). The Effect of School Type on Academic Student Achievement: Evidence from Indonesia. *World Bank Policy Research Working Paper 3604*.

Organisation for Economic Co-operation and Development (OECD). (2009). *Equally prepared for life? How 15-year-old boys and girls perform in school*. Paris: OECD.

OECD (2007). PISA 2006. *Science competencies for tomorrow's world*. Volume 1: Analysis. OECD: Paris.

Raudenbush S. W., & Bryk A. S. (2002). *Hierarchical linear models: Applications and data analysis methods (Vol. 2)*. Thousand Oaks, Cal.: Sage.

Raudenbush S. W., Bryk A. S., Cheong, Y. E., Congdon, R.T., & duToit, M. (2004). *HLM6: Hierarchical linear and nonlinear modeling*. Lincolnwood, Illinois: Scientific Software International.

Raudenbusch, S. W. & Williams, J.D. (1991). Pupils, classrooms and schools. International studies of schooling from a multilevel perspective. New York: Academic Press.

Sjafrudin, A. (2008). Analisis Hasil Ujian Nasional Madrasah Tsanawiyah Tahun. *Analisis Statistik Data Pendidikan Islam Tahun 2008*. Departemen Agama: Direktorat Pendidikan Islam, Jakarta Available at: http://pendis.depag.go.id/file/dokumen/analisis200803.pdf

UNESCO-IIEP (2004). Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) – *Data Archive for the SACMEQ I and SACMEQ II projects (Version 4.0)*. CD compiled by K. Ross, M. Saito, S. Dolata, M. Ikeda & L. Zuze. Paris: International Institute for Educational Planning.

USAID (2006). *Analysis of the Current Situation of Islamic Formal Junior Secondary Education in Indonesia*. Available at: http://pdf.usaid.gov/pdf_docs/PNADP007.pdf

World Bank (2010). *World Bank supports scale-up of successful education program*. Accessed 28 May 2010. Available at:

World Bank, Human Development Sector Reports, East Asia and the Pacific Region (2004a). *Vietnam: Reading and mathematics assessment study, Volume 2: Results*. Report No. 29787–VN (V2).

World Bank, Human Development Sector Reports, East Asia and the Pacific Region (2004b). *Vietnam: Reading and mathematics assessment study, Volume 3: Methodology*. Report No. 29787–VN (V3).

Wright, M. & Scullion, P. (2007). Quality of school life and attitudes to Irish in the Irish-medium and English-medium primary school. *Irish Educational Studies, 26* (1), 57-77.

APPENDIX A

Instruments Used in the Main Study

The eight instruments used in the QEM study are secure. The instruments are:

- Mathematics test
- Science test
- Indonesian test
- English test
- Student background questionnaire
- School life questionnaire
- Principal interview
- School inventory

If you would like information on accessing these instruments, please contact:

Prof. Dr. Mohammad Ali
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APPENDIX B

Results of Item Analyses on the Four Academic Tests

Percentage Correct for the Mathematics Test Within Each Region

Item No	East	Java	West	Total
1	68.0	82.9	76.2	79.5
2	71.0	80.1	71.4	77.0
3	68.4	72.9	65.2	70.6
4	46.5	65.7	51.8	60.1
5	58.6	72.1	61.1	67.9
6	56.7	67.8	58.5	64.3
7	43.7	65.0	54.5	59.9
8	52.0	56.6	49.4	54.4
9	44.0	57.0	45.1	52.7
10	49.0	61.4	48.8	57.0
11	45.8	52.6	45.5	50.1
12	42.8	51.9	43.8	48.9
13	39.3	56.1	40.5	50.4
14	25.9	37.4	24.6	33.0
15	40.7	45.2	35.4	42.4
16	45.2	53.3	48.5	51.2
17	36.3	47.2	35.6	43.2
18	33.9	40.7	35.1	38.6
19	34.2	38.5	37.6	37.7
20	25.9	29.2	24.1	27.7
21	38.6	41.6	40.3	40.9
22	41.6	40.3	39.4	37.8
23	33.0	39.3	30.8	36.6
24	11.5	22.0	13.4	18.7
25	24.7	31.3	21.7	28.3
26	27.2	35.1	30.8	33.1
27	22.7	36.0	26.8	32.2
28	19.3	33.0	20.4	28.4
29	15.4	20.1	18.3	19.1
30	21.2	22.5	19.8	21.7

- Item 1 was answered correctly by almost 80 percent of the overall sample. This item assesses 'Number', and was the item most often answered correctly by students in Java and the West. Item 2, which also measured 'Number' was the easiest item for those in the East.
- Students in Java correctly answered all but one of the items (item 22) more often than did students from either the East or West. Item 22 assesses 'Measurement'.
- Item 24 was the most difficult item for students overall, being correctly answered by 18.7 percent of students. This item assesses 'Number'. At the regional level, this item was the most difficult for those in the West and East, but not Java. Item 29, which assesses 'Algebra', was the most difficult item for students in Java.

Percentage Correct for the Science Test Within Each Region

Item No	East	Java	West	Total
1	84.2	92.4	88.5	90.5
2	82.2	83.5	79.4	82.4
3	61.3	76.5	69.6	73.0
4	68.6	72.9	64.4	70.5
5	70.4	75.3	73.7	74.3
6	74.3	67.9	75.2	70.4
7	65.2	69.8	72.6	69.8
8	55.1	64.7	57.4	61.8
9	65.7	65.8	67.1	66.0
10	57.2	57.8	49.3	55.8
11	68.1	68.5	70.6	68.9
12	45.2	59.9	52.2	56.3
13	48.5	52.1	49.7	51.1
14	42.5	52.4	44.5	49.4
15	40.1	43.6	41.0	42.5
16	43.6	55.1	44.0	51.1
17	31.0	50.8	44.4	46.8
18	38.9	46.7	37.5	43.7
19	37.6	44.2	37.2	41.8
20	34.3	43.4	36.2	40.6
21	39.9	45.6	42.6	44.2
22	34.8	42.3	30.7	38.8
23	34.0	31.7	30.2	31.6
24	30.1	35.6	30.8	33.8
25	40.8	45.8	38.7	43.6
26	30.2	32.3	26.7	30.8
27	23.3	35.0	31.0	32.6
28	33.1	36.2	27.0	35.5
29	25.9	32.9	20.8	29.3
30	18.8	20.7	21.7	35.9

Percentage Correct for the Indonesian Test Within Each Region

Item No	East	Java	West	Total
1	72.3	82.3	70.6	78.4
2	75.2	80.8	78.1	79.4
3	57.6	60.7	59.3	60.0
4	69.0	78.3	70.7	75.4
5	56.2	66.6	52.5	62.1
6	58.8	68.9	58.7	65.3
7	60.3	69.7	63.7	67.2
8	67.3	69.4	66.2	68.4
9	60.1	68.3	60.7	65.6
10	60.0	60.5	56.3	59.5
11	52.0	56.4	49.6	54.3
12	2.7	2.0	2.8	2.3
13	39.4	46.5	45.5	45.4
14	50.9	57.2	51.8	55.1
15	82.7	89.1	83.4	87.0
16	38.6	49.1	44.9	46.8
17	67.3	69.5	69.9	69.3
18	41.1	50.9	45.1	48.4
19	40.4	39.4	36.8	38.9
20	45.8	49.7	44.0	47.9
21	38.1	44.4	33.0	41.1
22	41.0	46.6	46.9	45.9
23	30.6	34.3	25.0	31.8
24	26.1	30.8	25.6	29.0
25	39.6	34.9	35.3	35.6
26	34.6	46.8	38.7	43.4
27	21.8	30.0	25.7	28.0
28	41.7	37.8	34.1	37.5
29	25.7	28.2	26.5	27.5
30	29.3	34.5	29.4	32.7

Percentage Correct for the Indonesian Test Within Each Region

Item No	East	Java	West	Total
1	48.8	62.6	49.0	57.8
2	36.5	53.2	39.9	48.1
3	61.3	65.9	59.4	63.9
4	15.7	9.2	12.4	10.7
5	66.5	77.7	69.8	74.4
6	58.2	68.0	60.2	65.0
7	36.5	48.4	42.4	45.5
8	51.2	59.1	51.9	56.4
9	55.0	50.2	53.4	51.5
10	76.7	86.1	79.5	83.4
11	58.0	72.3	59.9	67.7
12	66.7	78.7	68.5	74.9
13	40.0	59.3	44.5	53.5
14	43.0	53.3	43.1	49.7
15	47.0	48.5	45.8	47.7
16	40.0	44.8	41.7	43.5
17	47.3	58.3	55.3	56.2
18	22.1	30.1	25.6	28.1
19	28.3	34.3	27.2	31.9
20	56.2	74.5	63.3	69.6
21	51.8	68.5	60.1	64.4
22	37.7	46.3	40.1	43.8
23	57.9	76.3	65.1	71.4
24	44.9	55.3	49.9	52.7
25	45.4	61.7	49.2	56.8
26	23.2	24.1	26.1	24.5
27	58.2	68.0	58.4	64.6
28	41.9	54.5	46.9	51.1
29	44.9	58.2	51.5	55.0
30	70.6	80.3	71.4	77.0

APPENDIX C

Calculation of Variance Components at Student-and School-Level and Variance Explained at Each Level by Final Model

1. For Mathematics achievement model

number of cases	Estimation of variance components between:	
	students ($\hat{\sigma}^2$)	schools ($\hat{\tau}_\pi$)
	6071	145
fully unconditional HLM model	19.57	11.01
final two-level HLM model	18.62	6.27

Variance at each level:

Between students $$\frac{\hat{\sigma}^2[\text{fully unc.}]}{(\hat{\tau}_{00}[\text{fully unc.}] + \hat{\sigma}^2[\text{fully unc.}])} = \frac{19.57}{11.01 + 19.57} = \frac{19.57}{30.58} = 0.64$$

Between schools $$\frac{\hat{\tau}_{00}[\text{fully unc.}]}{(\hat{\tau}_{00}[\text{fully unc.}] + \hat{\sigma}^2[\text{fully unc.}])} = \frac{11.01}{11.01 + 19.57} = \frac{11.01}{30.58} = 0.42$$

Proportion of variance explained by final two-level model in mathematics

Between students $$\frac{(\hat{\sigma}^2[\text{fully unc.}] - \hat{\sigma}^2[\text{final}])}{\hat{\sigma}^2[\text{fully unc.}]} = \frac{19.57 - 18.62}{19.57} = \frac{0.95}{19.57} = 0.05$$

Between schools $$\frac{(\hat{\tau}_\pi[\text{fully unc.}] - \hat{\tau}_\pi[\text{final}])}{\hat{\tau}_\pi[\text{fully unc.}]} = \frac{11.01 - 6.27}{11.01} = \frac{4.82}{11.01} = 0.43$$

2. For English achievement model

number of cases	Estimation of variance components between:	
	students ($\hat{\sigma}^2$)	schools ($\hat{\tau}_\pi$)
	6071	145
fully unconditional HLM model	22.38	16.17
final two-level HLM model	20.20	9.77

Variance at each level:

Between students

$$\frac{\hat{\sigma}^2[\text{fully unc.}]}{(\hat{\tau}_{00}[\text{fully unc.}] + \hat{\sigma}^2[\text{fully unc.}])} = \frac{22.38}{16.17 + 22.38} = \frac{22.38}{38.55} = 0.58$$

Between schools

$$\frac{\hat{\tau}_{00}[\text{fully unc.}]}{(\hat{\tau}_{00}[\text{fully unc.}] + \hat{\sigma}^2[\text{fully unc.}])} = \frac{16.17}{16.17 + 22.38} = \frac{16.17}{38.55} = 0.42$$

Proportion of variance explained by final two-level model in mathematics

Between students

$$\frac{(\hat{\sigma}^2[\text{fully unc.}] - \hat{\sigma}^2[\text{final}])}{\hat{\sigma}^2[\text{fully unc.}]} = \frac{22.38 - 20.20}{22.38} = \frac{2.18}{22.38} = 0.10$$

Between schools

$$\frac{(\hat{\tau}_\pi[\text{fully unc.}] - \hat{\tau}_\pi[\text{final}])}{\hat{\tau}_\pi[\text{fully unc.}]} = \frac{16.17 - 9.77}{16.17} = \frac{6.40}{16.17} = 0.40$$

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