school uniforms to ensure that these are not made more important than provision of resources for learning and home study.

4. **The QEM study highlights the relationship between higher student performance and the provision of good infrastructure, qualified personnel and learning resources.** This has implications for how schools, local and national governments allocate and manage resources. It also underscores the importance of monitoring and targeting funds to areas of need.

5. **Efforts to ensure the provision of qualified teachers and principals must become more urgent and more strategic.** The high wages cost and the inefficient distribution of qualified teachers are difficult to address in a decentralised environment. Continuing positive dialogue and policy development are needed on redeployment, multigrade teaching and dual subject specialisation as being efficient and educationally sound strategies for ensuring that students have qualified teachers.

What can principals and teachers do right now, without extra financial resources, to lift the performance of Madrasah students?

1. **Principals and teachers can promote high expectations.** Through parent meetings and formal and informal communications with community they can continually raise awareness of the role of high expectations and home study resources for success in learning. In regular school assemblies and class meetings, teachers can promote and discuss role models and "heroes" to encourage students to have high expectations and believe that they can achieve their goals. Schools should review their practices in grade repetition as this generally has more negative than positive impacts on performance.

2. **Principals can take a stronger educational leadership role within their schools** by: making regular visits to teachers in their classrooms; observing and providing feedback on teaching practice; assisting teachers to develop effective lesson plans and regular assessment including provision of meaningful feedback to students, to establish good homework habits and to develop positive classroom environments.

3. **Teachers can enhance boys' and girls' variable performances** in English, Bahasa Indonesia and Science. Through the school level curriculum development process, teachers can investigate gender differences in performance and develop activities such as extra reading time with appropriate and interesting materials for boys, debating and public speaking in English as well as Bahasa Indonesia, develop science activities related to girls' interests and consider establishing single sex classes in these subjects for a period of time.

4. **Principals and School Committees can discuss and prioritise** BOS expenditure for educational equipment and teaching and learning resources, especially library books and science equipment. This may be more effective than hiring additional teachers. Teachers may need support in the effective use and management of new resources.

5. **Principals and School Committees can develop an annual and longer term development plan** (3 – 5 years) to improve the condition of their school through regular building maintenance and systematically increasing resources. This process should be guided by school self-evaluation against the requirements for school accreditation and district plans for meetings the MSS. School supervisors have an important role in supporting this planning process.

What can the local and national government do to lift the performance of madrasah?

1. Commit to regular monitoring of Madrasah school performance and school conditions by supervisors and district-level officials, supplemented by annual or bi-annual national sample based monitoring of Madrasah.

2. Prioritise and support school-based in-service professional learning which focuses on classroom practice.

3. Strengthen leadership programs for principals to ensure they can provide effective pedagogical leadership in their schools.

4. Review the plan for upgrading teachers' and principals' qualifications and ensure that all Madrasah have a critical mass of qualified teachers and all schools have a qualified principal.

5. Review teacher deployment and appointment practices to ensure Madrasah in disadvantaged areas have sufficient qualified teachers.

6. Identify regional and district patterns in education resourcing and expenditure and formulate intervention plans to equalise learning opportunities.

The main QEM study was a collaborative venture led by AusAID and co-funded by the Basic Education Capacity Trust Fund administered through the World Bank, which also provided logistical and communications support. The study was overseen by the Director-General for Islamic Education in the Ministry of Religious Affairs. All technical aspects of test development, sampling, test procedures and analyses were the responsibility of the Australian Council of Educational Research. Implementation, field monitoring, cultural and educational advice was provided by the Indonesian University of Education (UPI) at Bandung.
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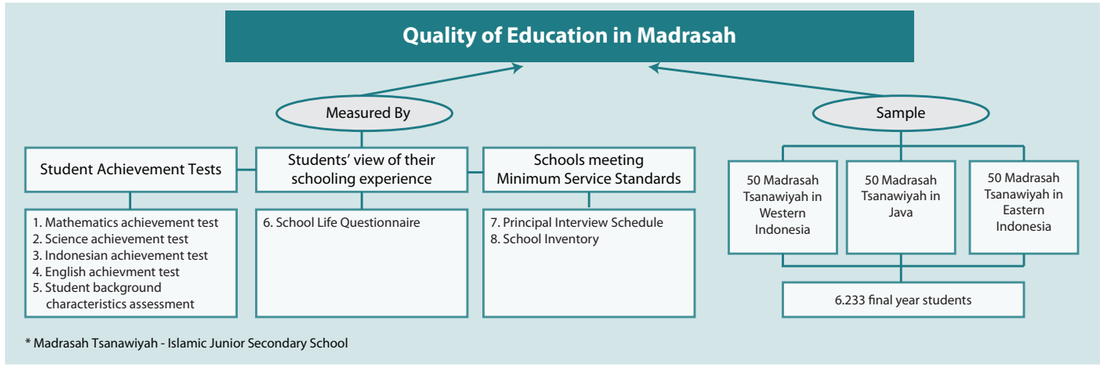
Measuring Student Learning Achievement in Madrasah

This policy brief arises from a national study which measured the learning outcomes of Year 9 Madrasah students in Maths, Science, English and Bahasa Indonesia together with the influence of student, family and school background factors.

DIAGRAM 1 : QUALITY OF EDUCATION IN MADRASAH



* Madrasah Tsanawiyah - Islamic Junior Secondary School

Why was the QEM study conducted?

Madrasah constitute an established, and still growing, sub-sector in education. Because of their history, they are more prevalent in rural and disadvantaged areas – the very areas where the most strategic effort will be required to achieve national goals for participation and quality. These are also the areas with the lowest achievement on both international tests and national exams and therefore in most need of education intervention.

Furthermore, in an era of increased accountability, parents, community and government want information about the academic outcomes of Madrasah which they expect to deliver high quality education, both religious and academic.

Overview of the study

The purpose of the study was to investigate the quality of education using international-style tests of achievement and to examine the relationship between achievement and school and home background factors.

Instruments

Four tests of academic achievement. The Maths and Science tests each comprised 30 multiple choice items and included link items from Program for International Student Assessment (PISA), Trends in Mathematics and Science Study (TIMSS) and the International Benchmark Tests of Mathematics. The English test was adapted from the Competency in English as a Foreign Language Assessment (CEFLA) which is a reading comprehension test in English. The Bahasa Indonesia test was specifically developed for the study.

School Life Questionnaire. This measures students' perceptions and attitudes about schooling – relationships with teachers, relevance of schooling to their future, sense of achievement, feelings of self-worth and the social integration of the school. The questionnaire is widely used in international programs as a measure of the affective domain of education.

Summary of Findings

- Across the 3 regions, student achievement in Maths, Science and English was well below the international average on items drawn from international tests such as the Programme for International Student Assessment (PISA) and the Trends in International Mathematics and Science Study (TIMSS).

- Positive correlations were found between student achievement and home-background factors such as level of resources, including books and study resources in the home, students' aspirations and parents' level of education.

- School factors associated with higher performance included the qualifications and professional practice of teachers and principals, the number of resources in the school and the amount of instruction and homework. While larger school size appeared to be associated with higher achievement, it was not school size per se that made the difference, but the association of increased size with factors such as more resources, more qualified teachers and better facilities.

- There were some gender differences in achievement which are common across many countries: girls performed better than boys in the language tests (English and Bahasa Indonesia) and boys performed better than girls on Science. There was no gender difference in Maths performance.

Student/home background questionnaire (adapted). This questionnaire is widely used in conjunction with achievement testing to gather data about home background factors which are generally thought to be associated with achievement – eg. language spoken at home, parents' level of education and level of resources in the home. Students filled out both questionnaires with their test papers.

Principal and School Inventory. Principals were interviewed about school and teacher characteristics such as teacher qualifications, student enrolment, school governance and management practices, teaching and assessment practices and school resources. The School Inventory covered an abridged list of the items in the draft Minimum Service Standards (MSS) including aspects of curriculum, teaching process, teacher qualifications, facilities, infrastructure, management and evaluation.

Methodology

Year 9 was selected for testing, being the final year of junior secondary education. The subjects to be tested were the core academic subjects and matched those tested by national exams and the international testing programs in which Indonesia participates. The 8 instruments above were developed or adapted and piloted to ensure their reliability and validity. Testing was conducted by trained education researchers mainly drawn from post-graduate level in a university Education faculty. Teams spent 2 days in a school to complete the testing, interviews and observations.

Sample

A nationally representative random sample was designed to allow separate analyses for the 3 major geographic areas of Indonesia. The 12,396 Madrasah which had a Year 9 class constituted the sampling frame. Schools were divided into the 3 main regions and then sorted according to province, public/private schools, achievement group (based on previous year's exam scores) and school size. 150 schools were then randomly selected for the study.

Types of Analyses

Student achievement scores were aggregated to school level and a range of descriptive and correlational analyses undertaken. In recognition of the complex relationships involved in student achievement, Hierarchical Linear Modelling (HLM) was applied to further explore the relationship of English and Maths with student and school background factors.

Potential Value of the Study

The study is the first international-style assessment of learning outcomes in Maths, Science, English and Bahasa Indonesia for a nationally representative sample of Madrasah. It provides a benchmark of Madrasah student performance and the factors which are associated with student achievement. A legacy of the study is the high quality instruments and methodology that, with minimal refinement, can be used for regular sampling in both MONE and MORA systems.

1. Home background:

Socio-economic status brings a powerful advantage: In each of the regions, but especially in the East and West, students with the most resources at home, both educational (books, magazines, study materials) and general material resources (such as electricity, TV, radio, piped water, and motorbike) performed better on all the tests. The number of books students had access to at home was more strongly correlated with achievement in English and Science than in Maths and Bahasa Indonesia.

These student and home background factors had a greater impact on performance in the East and West than in Java where overall standards of living may be higher.

Both parents have an influence: Both mothers' and fathers' education level was associated with high performance in English but over all the tests, it was fathers' level of education that had the strongest association. The language spoken at home, whether students boarded or lived at home, how many meals they had per day, whether students did some work for the family, whether they had someone to help with homework or whether they received private coaching, did not appear to make a significant difference to performance on the tests.

DIAGRAM 2: PERFORMANCE WITHIN EACH REGION ON MATHEMATICS, SCIENCE, INDONESIA AND ENGLISHT TEST

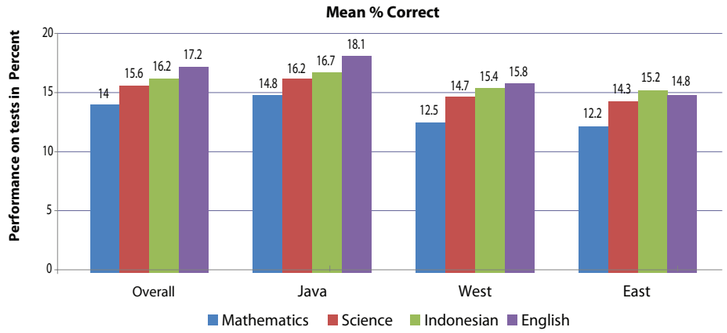
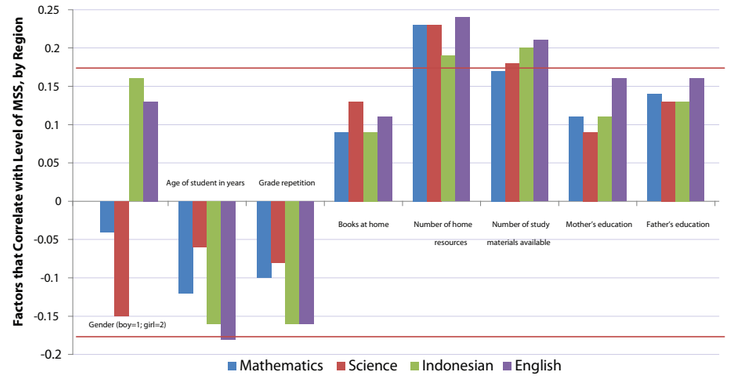


DIAGRAM 3: CORRELATES OF STUDENT CHARACTERISTICS AND ACHIEVEMENTS, OVERALL



2. Student performance and attitudes:

Overall, gender differences were not significant but girls scored better in the language tests and boys scored better in Science. Importantly, students who had high aspirations performed better on all tests. Conversely, students who had repeated a grade at some point in their schooling performed more poorly on all tests. Absenteeism did not appear to be correlated with performance. Across all schools, students generally felt positively about the things they were learning at school and the relevance of these things to their future lives. Students who were able to borrow books from their library and who had teachers who marked the set homework, generally had more positive attitudes towards schooling. Students in schools that were in poor condition and had never been visited by a supervisor had more negative feelings about schooling.

3. School factors:

Teachers make a difference: Across all schools, but especially in the East and West, students scored better in schools with more highly qualified teachers. Students also scored higher in schools where there were more lessons per week, where teachers had lesson plans and objectives for the class, where teachers gave weekly assessments and feedback to students and set homework frequently. Whether or not teachers marked all the set homework did not seem to be related to test performance.

Principals make a difference: In the West, schools with more highly educated principals performed better than others. Students in the West also scored better in schools where principals made regular visits to classrooms and gave feedback to teachers about their performance. In the overall sample, 90% of principals were male; the average age was 44 years; 70% held a bachelor's degree, and around 90% of principals taught 9 lessons per week.

School resources make a difference: School resources were positively correlated with student achievement, even after the impact of higher socio-economic status was taken into account. Some resources were more important in some regions than others – for example, in the East, students in schools with science laboratories and science equipment scored higher than others. In the West, achievement differences were associated with the school having a separate, furnished principal's office. In Java, the overall physical condition of school buildings was correlated with achievement.

How big a difference can schools make to student achievement?

In education research, differences in students' achievement scores are generally attributed to 3 main sources - student level factors, classroom level factors and school level factors. Accurate measures of the relative contribution to achievement scores from these 3 sources help policy-makers to understand what influences learning and where their interventions can be focused. The higher the level of variation attributable to within-school (classroom level) or between-school differences, the more the scope for improvement.

For example, on the QEM Maths results, 64% of the variance was attributed to individual student factors and 36% to school factors. This 36% is both good and bad news. The bad news is that schools are not equal in their impact on student learning. Some schools are producing higher outcomes, regardless of the ability of students or the type of home background. This finding is similar to the 2006 PISA results for Indonesia on which 33% of the variation in Maths scores was due to between-school differences. The good news is that the study has clearly identified some of the school level factors that make a positive difference to achievement.

Table: Student level vs school level sources of variation in student achievement scores on QEM and PISA results.

% variance and source	QEM Indonesia 2009	PISA Indonesia 2006	PISA OECD countries 2006	PISA Non-OECD countries 2006	PISA Thailand 2006	PISA Australia 2006
Student factors	64	67	63.2	60	71.2	80.2
Between-school factors	36	33	36.8	40	29.8	19.8

RECOMMENDATIONS

Key Policy issues for consideration

1. **Regular and reliable monitoring of student achievement is an important step in efforts to improve quality of education.** Indonesian policy makers cannot rely on national exams and international testing programs to provide the kind of information that is useful for improvement, especially for a sub-sector. A well designed and managed sample testing program is an affordable solution and when implemented with collection of background data on school and home factors it enables policy makers to prioritise programs and expenditure to make the most difference.
2. **The QEM study identified significant correlates of achievement which can be readily addressed by schools now, at little additional cost, but these actions require leadership from principals and supervisors.** Qualified and experienced principals can make a difference by regularly visiting classrooms, giving feedback and advice to teachers. Principals themselves should be supported by supervisors who are well qualified, experienced and have a budget for travel and education resources. A planned program and a cooperative climate which supports continuous professional learning within the school is a highly effective and affordable way of enhancing teaching practice without the significant disruption and cost of off-site meetings.
3. **Principals and teachers can influence parents to support their children's learning by prioritising their limited financial resources for education to books and home study materials.** A recent study and much anecdotal evidence suggest that since school fees have been largely abolished, parents' education expenditure is primarily allocated to provision of uniforms and snacks. This is especially worrying in disadvantaged areas. Schools and parents should be encouraged to review their local school policy on the number and costs of