



CAMBODIA EDUCATION SECTOR

PUBLIC EXPENDITURE TRACKING AND QUALITY OF SERVICE DELIVERY SURVEY



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WORLD BANK GROUP

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Abbreviations and Acronyms

ADB	Asian Development Bank
BMC	Budget Management Center
BSEC	Budget Strategy and Enforcement Center
CCLS	Cambodia Child Labor Survey
CDRI	Cambodia Development Research Institute
COM	Council of Ministers
CSES	Cambodia Socio-Economic Survey
DBFA	Department of Budget and Financial Affairs
DC	Domestic Canvassing
DCO	Direct Contracting
DOE	District Office of Education
DHS	Demographic and Health Survey
DP	Direct Purchase
DPP	Department of Public Procurement
ECE	Early Childhood Education
EFA	Education for All
EMIS	Education Management Information System
ESP	Education Strategic Plan
IFAPER	Integrated Fiduciary Assessment and Public Expenditure Review
MEF	Ministry of Economy and Finance
MOEYS	Ministry of Education, Youth and Sport
MOH	Ministry of Health
MRD	Ministry of Rural Development
NA	National Assembly
NAA	National Audit Authority
NBC	National Bank of Cambodia

NT	National Treasury
O&M	Operation and Maintenance
OPM	Office of Prime Minister
PAP	Priority Action Program
PB	Program Budget
PEAC	Pre-qualification, Evaluation and Award Committee
PEFM	Public Expenditure and Financial Management
PFMRP	Public Financial Management Reform Program
POE	Provincial Office of Education
PETS	Public Expenditure Tracking Survey
PNBC	Provincial Branch of the National Bank of Cambodia
POEF	Provincial Office of Economy and Finance
PT	Provincial Treasury
PU	Procurement Unit
QSDS	Quality Service Delivery Survey
RGC	Royal Government of Cambodia
Sida	Swedish International Development Cooperation Agency
SIF	School Improvement Fund
SIG	School Improvement Grant
SNEC	Supreme National Economic Council
SOB	School Operational Budget
SSC	School Support Committee
WB	World Bank

Executive Summary

The Ministry of Education, Youth and Sport (MoEYS) and the Ministry of Economy and Finance (MEF), together with key Development Partners, conducted a Public Expenditure Tracking Survey (PETS) and Quality of Service Delivery Survey (QSDS) for the education sector in Cambodia. PETS identify resource use and leakages by examining flows of funds and materials from the central government to local service providers via regional and local governments. QSDS are multi-purpose surveys that examine the efficiency of frontline service delivery and the dissipation of resources by collecting information on service providers and various agents in the system. Several PETS were conducted in Cambodia in the 2005-2013 period. They generally found leakage to be low but the timeliness and consistency of funds delivery to service providers to be poor. This PETS-QSDS will assist the Royal Government of Cambodia in its aim to improve the efficiency and effectiveness of public service delivery through several key reforms.

The educational structure of schooling in Cambodia is six years of primary, followed by three years of lower secondary then three years of upper secondary. Prior to primary, there is at least one year for pre-school education. Cambodia also has technical and vocational education, which commences after completion of grade 9. Higher education commences after grade 12.

Education funding

Over the past decade, Cambodia's experience with public funding of education has been mixed. Public recurrent funding of education has been increasing in Cambodia, with government commitment to further increases in both teacher wages and school operational funding. However, education budgets per student are still very low in Cambodia compared to neighboring countries at all levels of schooling. Furthermore, actual expenditure has not always reflected even the limited growth in budgets. Execution was only 86 percent of budget in 2014/15, although this improved to 90 percent in 2015/16 and 94 percent in 2016/17.

Several changes have been made to the process of funding the operational aspects of schools in the past few years. Funding of School Operational Budgets (SOB) is now all based on the Program Budget and accounted for in a uniform manner. All schools are required to have bank accounts and receive their transfers of funds from the government directly into those accounts. Since 2014, all schools have received School Improvement Grants (SIG) from the Swedish International Development Cooperation Agency (Sida). For SOB funds, the Cambodian government has a clear formula for allocation, with a fixed amount per school that differs according to the location and size of the school. In addition, the SOB's formula has a per capita student allocation. The SIG fund also has a clear formula, albeit simpler than that of the SOB for the fixed amount per school. The budgeting processes of SOB and SIG funds also differ.

Sampling and data collection

The study selected a sample of 400 schools (300 primary and 100 lower secondary) which provides reliable national estimates for primary and secondary schools and for provincial primary schools. The sample was drawn using two-stage stratified random sampling. To capture information, the study employed 13 survey instruments to gather information from key actors involved in the SOB and SIG fund processes. Data collection was undertaken by a contracted firm and conducted from December 2016 to March 2017.

The surveyed schools and personnel

Some key aspects of the surveyed schools:

- Of the 300 primary schools, 127 (or 42 percent of primary schools) were simply standalone primary schools, while 173 (58 percent) had an attached early childhood center. Three in five of the sampled secondary schools were lower secondary, and the remainder were full secondary schools covering grades 7-12.
- Primary school directors typically went to post-secondary college for their training, while secondary school directors attended a higher education institution and received a Bachelor's or Master's degree.
- On average, the school support committee—the joint school-community committee that is responsible for school planning and budgeting, overseeing spending of the operational funds, and keeping records—had about six members, with around 20 percent of the committee being female. Secondary rural schools had the largest committees, while secondary urban schools had the smallest. The latter also had the smallest proportion of women members, while primary urban schools had the largest.

School fund flows

The analysis of fund flows yielded three key findings regarding leakage, timeliness, and recordkeeping. SOB funds flow from the MEF and through the Provincial Treasury to school accounts. SIG funds come from Sida and flow through MoEYS to separate school bank accounts.

No leakage in fund transfers to schools

No leakages of funds took place in the transfers to schools. Almost all school accountants knew the amount of SOB to which their schools were entitled, which implies that schools would know if there were shortfalls in the amount of funds transferred to their bank accounts. All schools in the study's sample received their full amount of the SOB fund.

Late or slow disbursement of funds

The main challenge is the delay in disbursement at the beginning of the fiscal year, which could result in inefficiency of funds use. Schools expected to receive their first wave of funds in January but received it several months later, for example in April/May 2015 and in February/March 2016. The significant delay in funds transfer to schools at the beginning of each fiscal year is related to the budget request and approval processes. Like SOB, disbursement of SIG also faced some delays, albeit shorter. The timeliness of fund receipts improved to some degree in the 2015-2016 school year compared to 2014-2015, but nonetheless, delays continued.

Rigidity of SOB subaccounts was identified in previous PETS and remains an ongoing challenge. There are now 12 subaccounts in two SOB chapters (60 and 61) in which government funds flow to schools and in which the schools have to account to their respective POE. Most schools receive their funds allocated to the subaccounts even if these amounts do not reflect the needs of specific schools. (e.g. they may receive funds for paying for electricity even though the school is not connected). Moving funds between these lines is difficult and time consuming, taking many weeks or even months.

Poor recordkeeping at the school level

Over-reporting and underreporting of fund receipt is related to poor recordkeeping for both SOB and SIG funds. No single pattern of poor financial recording can be found according to type or location of school from 2015 to 2016. There are no indications that secondary schools do better than primary schools nor that schools in urban areas do better than schools in rural and remote areas in proper recording of their finances.

Quality of service delivery in education

Wide variation in funding between schools

Fund availability for schools' operations, which can affect school quality, varies considerably. Total operational funds available to schools (SOB and SIG combined) ranged from USD 248 to USD 25,833 per year. A school's level and location were strongly linked to the average total operational funds available to the school.

The proportion of SIG funds spent on quality aspects¹ is also important in assessing management and community intentions to improve the school. Total SIG funds reported to be spent on quality aspects ranged from USD 17 to USD 7,359 in 2015-16. It seems clear that even with a high level of management skills, small schools find it hard to make an impact on educational quality when total spending is at an average of USD 118.

Four indices measuring quality

High-quality schools facilitate student achievement and personal growth. Individual school quality has a number of dimensions and is a consequence of ‘internal’ aspects of school operation and ‘external’ aspects related to the socio-economic status of the parental community from which students are drawn. The indices here focus on operational aspects of the school, financial practices, and classroom and wider school environments. They provide information on things that can be changed through policy, training, and resource provision.

School quality aspects. Spending more on quality is strongly associated with a higher school quality index score.² Schools that spent about half or less of their SIG funds on quality scored less than half of the possible school quality index score. The one-fifth of schools in the sample that received the lowest amount of operational funds received between USD 248 and USD 1,092, while schools in the top quintile each received more than USD 3,103. Phnom Penh and Kampong Cham provinces were clearly ahead of the remaining provinces on this index, while Preah Vihear, a remote province in northwestern Cambodia, was well behind the other provinces in terms of overall school quality measures.

Financial management quality aspects. The total amount of operational funding was not significantly associated with financial quality in the sampled schools. Only those schools that spent 85 percent or more of their SIG on quality aspects had a higher mean for their financial quality score. More than 20 percent of all schools scored a maximum of 12 points in financial management, showing that a substantial minority of schools could cover all the financial management

1 Schools can allocate their SIG quality spending to the following areas: (a) increase teaching and learning materials in the classroom; (b) introduce experimental and corner subject materials in the school; (c) increase library materials and rooms; (d) improve the school environment and playground to be clean and green; (e) Initiate life skill practices, including agriculture; (f) support children with disabilities and vulnerable groups; (g) support slow learners and dropout prevention; (h) provide staff training and workshops, and (i) strengthen the quality and efficiency of school management.

2 Four quality indices were developed to measure general school quality, financial management quality, classroom quality and environmental quality. The school quality index has 16 items and was developed from the Director’s form, which covered much of the school functioning. It covers several aspects of the school, including recordkeeping, human resources, physical aspects, educational resources, and library resources. The financial quality index has 12 items which are part of the standard Ministry financial procedures and activities, and responsible school staff should have received training and manuals to cover them. The classroom quality index has ten items, and the data was gathered during a class observation session in either a Grade 3, Grade 5, or Grade 8 class. The first three items reflect the presence of a prepared teacher with a class, while the remaining seven reflect the presence of essential items for quality education such as textbooks, learning material, and suitable and adequate furniture for teacher and students. There are nine items in the environmental quality index which refer to both safety and utility. They include items related to safety, amenity, and utility. These can be improved with the quality funds available through SIG, and most can also be addressed through community involvement.

requirements. All provinces had fairly high average scores on financial management. Remote and rural schools of all types were more likely to have lower financial management scores. Either rural schools have had less training, or their school directors and financial officers have less capacity, than those in urban areas.

Classroom quality aspects. The 20 percent of schools that spent the lowest proportion of their SIG funds on quality had the lowest mean classroom quality scores. However, the relationship between spending on quality and classroom quality then reverses and falls as schools spend a higher proportion of their SIG funds on quality, which is unexpected. Not a lot of differences were found among the sampled provinces on this measure, suggesting that addressing this issue will be a task for the respective Provincial Departments of Education and District Departments of Education since poor schools on this measure are scattered rather than located in a few provinces. Lower and full secondary schools had relatively low average scores on classroom quality.

Environmental quality aspects. There is a strong positive relationship between the amount received by schools as operational funding (SOB plus SIG) and the environmental quality score. Schools that received the lowest amounts of operational funding had the lowest average scores, and schools that spent the lowest proportion of their SIG funds on quality outputs had the lowest mean environmental quality scores. Remote schools do very poorly in the assessment of school environmental quality. Addressing most of these environmental aspects can be costly—e.g., fencing the school grounds, providing sufficient safe toilets, establishing a bore for safe water in rural and remote regions. It is difficult to see how schools in the lowest quintile will be able to address such issues with their limited operating funds.

Mathematics and physics test outcomes

Levels of student achievement on mathematics and physics tests are low. Only eleven schools (five urban and six rural) have an average score of 50 percent or more on the mathematics test. Eight schools (two urban and six rural) averaged 50 percent or more on the physics test. Only five schools of the 100 in the sample averaged 50 percent or more on both tests, only one of which was urban.

Summary of findings on fund flows

Fund flows are expected to continue to be satisfactory, even with the anticipated change from two separate operational funding sources (SOB and SIG) to School Improvement Fund (SIF). The anticipated change is that the two amounts (SOB and SIG) will be combined at the national level to flow through the provincial treasury then into school accounts.

Even if funds are received in full, the efficiency of school operations and hence educational quality are affected if fund delivery is sufficiently delayed. Discrepancies between what the Provincial Office of Education (POE) recorded as sent and what schools recorded as received suggest that recordkeeping at the school level is not sufficiently accurate. This situation is found in both SOB and SIG funds.

Summary of findings on service delivery quality

Quality aspects were analyzed relative to total operational funding and to percentage of SIG spending on quality using the four quality indices developed from questions and observations on several of the school-based survey forms. Phnom Penh ranked at the top on three out of four indices, and Preah Vihear ranked last on all four. Clear differences were found in most of the quality indices between the provinces, suggesting that it would be useful initially to identify and target lower-quality provinces to get rapid gains in quality rather than simply address individual schools across all provinces.

Secondary schools had higher average school and environmental quality scores and lower average classroom quality scores than primary schools. Urban schools generally scored higher than rural and remote schools on financial quality. Secondary schools and non-urban schools were less likely to provide classroom storage and to have other books and reference material in the classroom.

The total amount of operational funds (SOB plus SIG) received by a school was positively related to all quality indices except classroom quality. More funds meant better quality if they were dedicated to quality improvement purposes. The proportion of SIG spent on quality was also positively related to all indices except classroom quality. Plans for SIF expenditure on schools to 2021 as part of the new Sida funding proposal indicate a sharp rise in per school operational funds over the period commencing in 2018, almost doubling school operational funds in SIF over the current combined SOB and SIG funds to schools.

Poor achievement on mathematics and physics tests reflect the quality of school outcomes and a need for quality enhancement, particularly for teaching and learning. With only five out of 100 schools in the sample scoring an average of 50 percent or more on both mathematics and physics tests, the challenge for quality improvement is huge.

Policy recommendations

Improve the timeliness of fund flows and align procedures for more efficiency in the management of school funds as SOB and SIG funds flow together as SIF. Currently, the separate provision of SIG funds through a different disbursement process means that they bridge the funding gap caused by the delay in the first quarter of SOB disbursement. Providing authorization for expenditure in quarter one to mirror that in quarter four of the previous year, with any rectification made in quarter two to balance the books, could be considered.

Ease the rigidity of SOB subaccounts to enable schools to execute budget in a way that matches their needs. Addressing this will require allowing SOB expenditure based on school's actual needs without the constraint of line items imposed in the 12 subaccounts of two SOB chapters (60 and 61). Schools can report on actual expenditures, while reporting of expenditure following line items

could still be retained by consolidating such expenditure at the provincial level. This can create efficacy in the use of SOB funds and improve development at the school level.

Consider providing SOB payments to small schools in full early in the fiscal year. Receiving one-quarter of a small amount four times a year precludes small schools from easily making major expenditures, such as those commonly needed to enhance the school environment.

Some measures to improve quality outcomes do not involve extra funding.³ Providing the intended number of instructional hours can be a powerful improver of outcomes. The strongest determinant of this in Cambodia is the prevalence of double-shifting in schools, which reduces overall instructional hours. This may involve school management measures such as providing the full number of instructional days and the full number of instructional hours.

Place top priority for school funds on boosting the quality of teaching and learning to improve substantive student achievement outcomes. The items could include support for slow learner students from week one of the school year, coaching of less experienced teachers by more experienced teachers in the school or from neighboring schools, teaching and learning materials, and sufficient drinking water and toilets for boys and girls.

Improve community knowledge and involvement in school budgets and spending. This could be achieved through (i) improving compliance checks with required budget disclosures to the school, committee, local community through public display, and anyone requesting school budget information during provincial and district staff visits to schools and (ii) regularizing disclosure of the budget and actual expenditures as part of opening and closing parental meetings at all schools.

Address widespread poor financial recordkeeping at the school level. This can be achieved through regular refresher training which could be organized on a regional basis, grouping together geographically close provinces to provide enough numbers each year and to make training courses cost-effective. Refresher training helps to address skill shortages, especially as attrition removes trained staff and replacements have no training. Furthermore, it is important that soft skills be included in the regular management training in addition to hard skills such as accounting and recordkeeping.

3 There may be some costs if this involves ensuring that replacement teachers are available during regular teachers' absences, and the provision of such replacements is much more difficult in remote and small schools than in large and urban schools.

1 Background and context

The Royal Government of Cambodia aims to improve the efficiency and effectiveness of public service delivery through several reforms, including the Public Financial Management Reform Program (PFMRP), led by the Ministry of Economy and Finance (MEF). The Ministry of Education, Youth and Sports (MoEYS) is one of the key stakeholders in this reform process. To contribute to implementation of the PFMRP at the sector level and to gain knowledge about how funds allocated to the education sector could be better targeted in a timely manner toward priority areas, the MoEYS and MEF together with key Development Partners conducted a Public Expenditure Tracking Survey (PETS) and Quality Service Delivery Survey (QSDS) for the education sector. The PETS is also an important fiduciary risk management measure. The previous PETS in the education sector was undertaken in 2005, and three small-scale PETS were completed in 2012 and 2013.

Objectives of the Cambodia Education PETS-QSDS

PETS and QSDS seek to analyze and address the efficiency and equity of public service delivery and can inform relevant policy reforms. To improve service delivery performance, PETS allows policymakers to follow how resources move from origin (funders) to frontline service delivery facilities and examines the efficiency of public spending. QSDS examines relevant incentive structures and various elements of service delivery by frontline providers. QSDS therefore assists in understanding how incentives and accountability systems are working in practice and how they can be improved.

PETS identify resource use and leakages by examining flows of funds and materials from the central government to local service providers via regional and local governments. They mainly evaluate the proportion of public resources

(financial, human, and in-kind) that reaches each level, particularly frontline service providers. QSDS are multi-purpose provider surveys that examine the efficiency of frontline service delivery and the dissipation of resources by collecting information on service providers and various agents in the system. These two instruments could be applied jointly to obtain a more complete picture of the efficiency and equity of public service delivery.

The main objective of this Cambodian PETS-QSDS was to trace fund flows, especially school funds, through the system from provincial treasuries to government schools, including early childhood centers up through full secondary schools. The survey also measured the timeliness of fund flows from the central level to schools and the impacts of the funds on school quality, teacher performance, and student learning outcomes. This is the second national PETS-QSDS in Cambodia. The first national Cambodian PETS-QSDS was conducted in 2004. This second PETS-QSDS study was conducted following reforms by the Cambodian government to transfer funds through banking systems rather than through physical cash deliveries from treasuries to provincial offices of education and to schools.

Cambodia's education system

The formal educational structure of schooling in Cambodia is formulated as 6+3+3. Prior to primary school, there is also at least one year for pre-school education (kindergarten) for children from age 3 to below age 6. Then follows nine years for the completion of basic education, which is divided into six years of primary education (grades 1 to 6) and three years of lower secondary general education (grades 7 to 9). Upper secondary education consists of three years (grades 10 to 12). Post-school formal education includes technical and vocational education, which commences after basic education (after completion of grade 9), as well as higher education, which commences after grade 12.

In practice, actual schools may take several forms. Most early childhood education (ECE) centers are incorporated physically in primary schools. Most secondary education can be found in a stand-alone lower secondary school, a stand-alone upper secondary school, or a full secondary school with classes from grades 7 to 12. In addition, Cambodia has a small number of stand-alone ECE centers and a small number of basic schools (grades 1 to 9). Any of the above types of school may be incomplete, either because the school is new and has not yet progressed students through all its appropriate grades or, in the case of primary schools, because it is isolated and makes provisions for young children who cannot walk to the more distant full school.

Education financing in Cambodia

Public funding of education in Cambodia has been increasing in recent years, with government commitment to further increases in both teacher

wages and school operational funding. The budget for wages has been increasing considerably and stood at 77 percent of the current budget in 2015. The capital budget has increased significantly, as well (14.3 per cent in 2016). Nonetheless, Cambodia ranked only above Myanmar in the sub-region for education expenditure either as a percentage of GDP or as a percentage of government expenditure. Education expenditure per student in Cambodia is very low compared to neighboring countries at all levels of schooling. This largely reflects the low levels of teacher salaries in Cambodia, although there are also school operational effects.

Actual expenditure has not always reflected the growth in budgets. Execution was only 86 percent of the budget in 2014-15, although this improved to 90 percent in 2015-16 and 94 percent in 2016/17. Measures to increase the efficiency of disbursement, such as payment of salaries and school operating budgets into teachers' and schools' bank accounts, will continue to improve expenditure-to-budget ratios. However, planning, financial management, and audit capacities also need to be increased.

In the past few years, several changes have been made in the funding process for the operational aspects of schools. These include changes in the composition of funding, the funds disbursement process, and the amounts available at schools. Public funds supporting the operations of schools come from two main sources: School Operational Budgets (SOB) from the government budget and School Improvement Grants (SIG) from the Swedish International Development Agency (Sida) starting from 2014. SOBs are now all based on the Program Budget (PB) and accounted for in a uniform manner. All schools are required to have school bank accounts and receive their fund transfers from the government directly into those accounts. Since 2014, all schools have received SIGs which, although considerably less than SOB funds, have arrived in schools generally well before SOB funds and with less constraints on their use. In addition to SOB and SIG, other sources of funding include contributions from parents, communities, NGOs, and other humanitarian organizations, but these sources are not properly recorded at schools.

The Cambodian government has a clear formula for allocation of SOB funds, which was developed jointly by MEF and MoEYS. The allocation formula has a fixed amount per school, but to accommodate differences in the sizes and hardship levels of schools, the fixed amount per school differs by type, location, and school size—more disadvantaged or bigger schools receive higher amounts of funding. In addition to the fixed amount per school, the SOB's formula also has a per capita student formula, allowing flexibility to accommodate schools with more students and schools with fewer students. For example, a primary school with six or less classes would receive the fixed amount of KHR 800,000 (USD 200) per year and KHR 10,000 (USD 2.5) per student per year under this allocation formula (Table 1).

Table 1: SOB Allocation Formula

School Type		School Operating Budget (KHR)	
		Per School	Per Student
Pre-School	Typical Area with 3 or fewer classes	400,000 (\$100.00)	9,000 (\$2.25)
	Typical Area with 4 or more classes	500,000 (\$125.00)	8,000 (\$2.00)
	Disadvantaged Area with 3 or fewer classes	450,000 (\$112.50)	10,000 (\$2.50)
	Disadvantaged Area with 4 or more classes	500,000 (\$125.00)	9,000 (\$2.25)
Primary School	Typical Area with 6 or fewer classes	800,000 (\$200.00)	10,000 (\$2.50)
	Typical Area with 7 or more classes	1,000,000 (\$250.00)	9,000 (\$2.25)
	Disadvantaged Area with 6 or fewer classes	1,000,000 (\$250.00)	12,000 (\$3.00)
	Disadvantaged Area with 7 or more classes	1,200,000 (\$300.00)	10,000 (\$2.50)
Secondary School	Typical Area with 10 or fewer classes	1,500,000 (\$375.00)	19,000 (\$4.75)
	Typical Area with 10 or more classes	2,000,000 (\$500.00)	17,000 (\$4.25)
	Disadvantaged Area with 11 or fewer classes	2,000,000 (\$500.00)	21,000 (\$5.25)
	Disadvantaged Area with 11 or more classes	2,500,000 (\$625.00)	19,000 (\$4.75)

Source: Joint MEF-MOEYS Prakas No. 508 (2013).

The SIG fund also has a clear formula, albeit simpler than that of the SOB for the fixed amount per school. For the SIG, the fixed amount per school is the same regardless of school size and location. The per capita student formula differs between schools located in typical areas and disadvantaged areas. Schools in disadvantaged areas receive more funds per student than those in typical areas (Table 2).

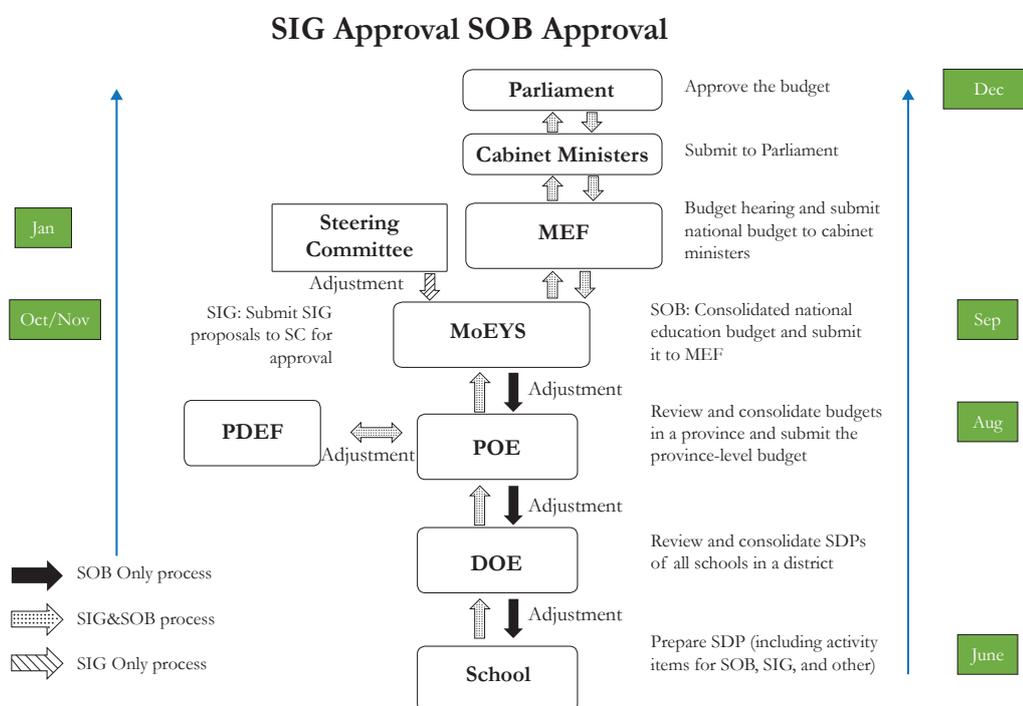
Table 2: SIG Allocation Formula

School Type	Per School (US\$)	Per Student (US\$)	
		Typical Area	Disadvantaged Area
Pre-School	69	1.41	2.12
Primary School	94	1.41	2.12
Lower Secondary School	144	2.12	3.17
Upper Secondary School	144	1.76	2.65

Source: SIG Financial Management Manual (2010).

Since SOB funds come from the Cambodian government, SOB goes through government budget procedures which include budget planning, review, negotiation, and approval processes. The budgeting processes start in June and are completed in December each calendar year. In theory, the SOB process starts with estimates of the budget needed at the school level based on the School Development Plan (SDP). Once each school completes the budget proposal, they submit to their District Office of Education (DOE) for consolidation before submitting to the Provincial Office of Education (POE) for further consolidation at the central offices of MoEYS before submitting to MEF. The SOB also goes through review and approvals from cabinet ministers and Parliament (Figure 1), since it is part of the government budget processes and envelope.

Figure 1: Comparison of SOB and SIG Processes



For SIG, the budgeting process starts in October or November, which is the beginning of the school year in Cambodia. In terms of funds request and approval, the process does not follow the steps of the government budget process since the funding source is a development partner (Sida). The process for SIG is simplified, although it starts with the same School Development Plan at the school level for budget request and consolidation processes at DOE and POE. It mainly involves entities within MoEYS, particularly POEs and Departments of Finance. In addition to the process within MoEYS, SIG fund requests go through a review and approval process by the Project Steering Committee, which has representatives from Sida and other government ministries including MEF.

Previous PETS studies in Cambodia

Several PETS were conducted in Cambodia in the 2005-2013 period. They generally found leakage to be low but the timeliness and consistency of funds delivery to service providers to be poor. The findings were taken into account in the directions recommended for this PETS-QSDS and the emphasis in the data to be collected and analyzed. The views of the Technical Working Group on the objectives, as well as national and sector financial system reforms that have taken place since the previous PETS were conducted, were also taken into account.

Four education sector PETS have been conducted in Cambodia, although none had major QSDS components. All four took place in the past ten years, with three of them being in the past four years. One focused on ECE, two on primary schools, and one on senior secondary schools. Some common issues emerged across these four studies:

- Reported leakage is low, apart from textbooks.
- In many provinces, timeliness is a problem between the Provincial Treasury and the POE.
- Most disbursement is timely within the education system, from POE to DOE to School.
- Disbursements appear to be mainly twice a year rather than the quarterly program that is mandated in the system.
- Use of credit or delayed purchases due to delayed disbursements to schools results in inefficiency and lack of effectiveness in spending resources.
- Problems with record keeping, incorrect reports, and poor monitoring heighten fiduciary risk.
- Inequitable distribution and rigidity in spending of funds further undermine effectiveness.
- Some stakeholders have poor knowledge of the financial system, making them unable to function as informed users and effective monitors.

Even though three of these PETS were undertaken in the past four years, a number of substantial reforms in education and its financial management system have taken place since then. One example of a major change is that over the 2014-2016 period, all government schools in Cambodia were required to open a bank account, which has transformed how schools receive both government funds and agency funds. Reforming the resource planning, delivery, and reporting system has been a high priority for the Ministry. Currently, the Ministry is discussing with an external agency support to develop a unified fund flow to schools, called a School Improvement Fund (SIF), with a view to introducing a single fund for school operations as a channel for both government and external funds with a single financial manual.

2 Method

Sampling

The study selected a sample of 400 schools (300 primary and 100 lower secondary). To provide a 95 percent confidence level with meaningful statistical results for primary and secondary schools, a sample of nearly 400 schools was necessary.

The study used the stratified random sampling method and was done in two stages. Multi-stage random sampling has been widely used in social surveys over many years and does not compromise the sampling statistically. In the first stage, schools were stratified by province and district and by primary/lower secondary level, using Education Management Information System (EMIS) data from 2015-2016. In the second stage, for each province, 40 schools (30 primary and 10 lower secondary) in five districts were selected randomly. From this two-stage sampling strategy, a total of 400 schools (300 primary and 100 lower secondary) in ten provinces were selected for conducting data collection.

Survey instruments

The study employed 13 study instruments to capture information about fund flows and impacts of the funds on service delivery at the school level and from key actors involved in the PB and SIG fund processes. This included survey modules for interviews with the Provincial Treasury, POE, DOE, school director, school accountant, teachers, students, parents, and School Support Committee members, as well as classroom observation. In addition to the survey instruments, the study used a national assessment test to conduct mathematics and physics tests for grade 8 students to assess their learning outcomes.

The 13 instruments were applied in each lower secondary school selected for this study, while only 9 study instruments were applied for each primary school selected due to budget constraints (Table 3). The four study instruments not applied in primary schools were classroom observation, student module, parent module, and mathematics and physics tests.

Table 3: Survey Instruments

Survey Modules		PETS or QSDS	Primary	Lower Secondary
1	Provincial Treasury	PETS	√	√
2	Provincial Office of Education	PETS	√	√
3	District Office of Education	PETS	√	√
4	School Director	QSDS	√	√
5	School Accountant (PB)	PETS	√	√
6	School Accountant (SIG)	PETS	√	√
7	School Support Committee	PETS/QSDS	√	√
8	Teacher Roster	QSDS	√	√
9	Teachers	QSDS	√	√
10	Quick Classroom Observation	QSDS	-	√
11	Students	QSDS	-	√
12	Parents	QSDS	-	√
13	Mathematics and Physics Tests (Grade 8)	QSDS	-	√

Data collection and cleaning

Data collection was undertaken by BN Consult and conducted from December 2016-March 2017. The BN Consult team visited all 400 schools but could collect information on SOB and SIG funds from only 391 schools due to failure to access school directors or school accounts or unavailability of financial records at schools. Hence, the data on SOB and SIG is only available for 391 schools, not 400 schools as anticipated (Table 4).⁴ Other data such as QSDS data was available for all schools.

⁴ **The nine schools that the data collection team could not meet or for which the team could not access financial information or for which financial information was unavailable were primary schools.** Specifically, the schools were (i) Bangkan in Rovieng district, Preah Vihear province; (ii) Chunhchaing in Choam Ksan district, Preah Vihear province; (iii) Damrei Slab in Kampong Svay district, Kampong Thom province; (iv) La Ang Bo Rae in Veal Veng district, Pursat province; (v) Peak Kantel in Ek Phnom district, Battambang province; (vi) Phtas Rung in Phnom Kravanh district, Pursat province; (vii) Robang Romeas in Bakan district, Pursat province; (viii) Sena Pramouk in Koulen district, Preah Vihear province; and (ix) Thmey in Mesang district, Prey Veng province.

Table 4: Sampling Distribution of the Survey and Actual Implementation

Province and District	Primary		Lower Secondary	
	Target	Achieved	Target	Achieved
Battambang (Ek Phnom, Kamrieng, Koah Kralar, Maung Russey, Sangker)	30	29	10	10
Kampong Cham (Chamkar Leu, Kampong Cham, Kampong Siem, Kang Meas, Srey Santhor)	30	30	10	10
Kampong Chhnang (Chul kiri, Kampong Leng, Rolea Pa-ir, Samaki Meanchey, Teuk Phos)	30	30	10	10
Kampong Speu (Chbar Morn, Oudong, Phnom Sruoch, Samrong Torng, Thporng)	30	30	10	10
Kampong Thom (Baray, Kampong Svay, Prasat Sambo, Sandann, Staung)	30	29	10	10
Phnom Penh (Chamkar Morn, Daun Penh, Po Senchey, Prek Pnuev, Tuol Kauk)	30	30	10	10
Preah Vihear (Choam Ksan, Koulen, Preah Vihear, Rovieng, Tbeng Meanchey)	30	27	10	10
Prey Veng (Kamchay Mear, Mesang, Peam Chor, Prey Veng, Svay Antor)	30	29	10	10
Pursat (Bakan, Krakor, Phnom Kravanh, Pursat, Veal Veng)	30	27	10	10
Tbaung Khmum (Dambe, Memot, O Raing Euv, Suong, Tbaung Khmum)	30	30	10	10
Total	300	291	100	100

During data collection, the survey team met people who were in charge of work directly related to SOB and school operations. At the Provincial Treasury, the survey team met with the head and/or deputy head of the Provincial Treasury and officer in charge of SOB. At the POE and DOE levels, the survey team met the director and/or deputy director and accounting officer and/or officer in charge of primary and secondary schools. At schools, the team met with school directors and/or school accountants. For the QSDS data, the team met with the school director or deputy director, selected teachers, sampled students and their parents, and members of the School Support Committee.

Checking and cleaning the data took considerable time and effort. Not all schools kept good records, requiring significant effort to revisit and check documents. In addition, several ongoing reforms and changes in the 2014-15 school year meant that accurate records were difficult to retrieve during this time, even at the provincial level. Comparison of provincial disbursement and school-level records showed some differences, with schools recording both lower and higher amounts.

3 Characteristics of the sample schools

This section describes the main characteristics of the schools and the people who make up the school community. Most of the remainder of the report will analyze aspects of either the disbursement or management of school finances (the PETS aspect) or the quality aspects of schooling that are the presumed outputs of that funding (the QSDS aspects). This section looks at the directors, teachers, students, parents, and committee members. It focuses more on the secondary schools as more data on teachers, students and their families, and school committees was collected for secondary schools than for primary schools, mainly due to cost—each extra set of data, especially for students and their families, was quite costly in terms of interviewer time.

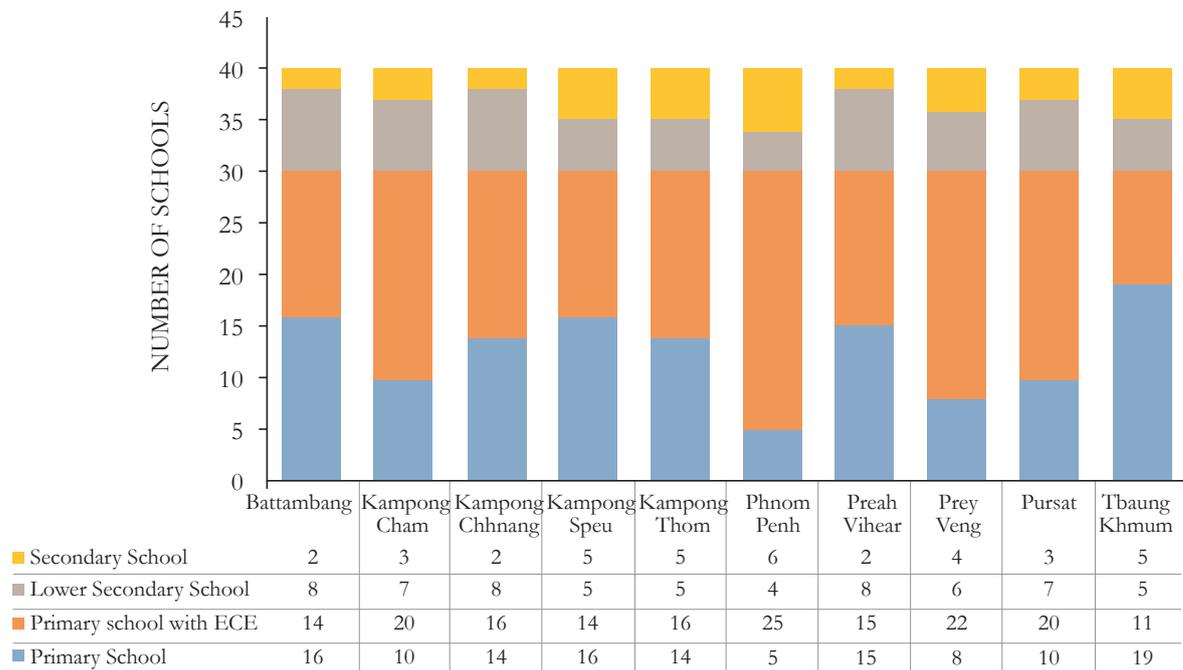
School types and enrollments

Overall, the sample schools were slightly over-represented in the full secondary category and under-represented in the stand-alone primary schools compared to the total population of government schools in Cambodia (Table 5). Three-quarters of the sample were primary schools by choice, while four-fifths of all government schools (excluding ECE standalone centers) were primary schools in 2015/16. The sample schools were more likely to be in urban areas and thus larger. Thus, the sample represented 4.5 percent of government schools and 6.5 percent of government school students. Most of the differences arise from the sampling choice to select 300 primary schools and 100 secondary schools to ensure sufficient numbers of secondary schools within the limited budget available for data collection. Representative proportions would have meant 320 primary schools but only 80 secondary schools and an unacceptable margin of error.

Table 5: Sample and National Schools Compared

	Sample		National	
	Number	Percent	Number	Percent
Schools	400	100%	8,799	100%
Standalone Primary	127	32%	3467	39%
Primary with ECE	173	43%	3618	41%
Lower Secondary	63	16%	1,251	14%
Full Secondary	37	9%	463	5%
Location	400	100%	8,799	100%
Urban	90	23%	1,387	16%
Rural	238	60%	7,412	84%
Remote	72	18%		
Average student enrollment	455		322	
Standalone Primary	217		{284	
Primary with ECE	490			
Lower Secondary	353		250	
Full Secondary	1,282		1,106	
Total student enrollment	181,916	100%	2,835,743	100%
Standalone Primary	27,392			
Primary with ECE	84,855	62%	2,010,673	71%
Lower Secondary	22,240	12%	312,991	11%
Full Secondary	47,429	26%	512,079	18%

The number of schools, both primary and secondary, was constant by province. However, within each province, the random sampling meant that the number of primary schools with and without attached ECEs varied, as did the number of lower and full secondary schools. Of the 400 schools in the sample, 127 (or 42 percent of primary schools) were standalone primary schools, while 173 (58 percent) had an attached ECE. Of the 100 secondary schools, 63 were lower secondary only, and the remaining 37 were full secondary schools (Figure 2).

Figure 2: School Types by Province


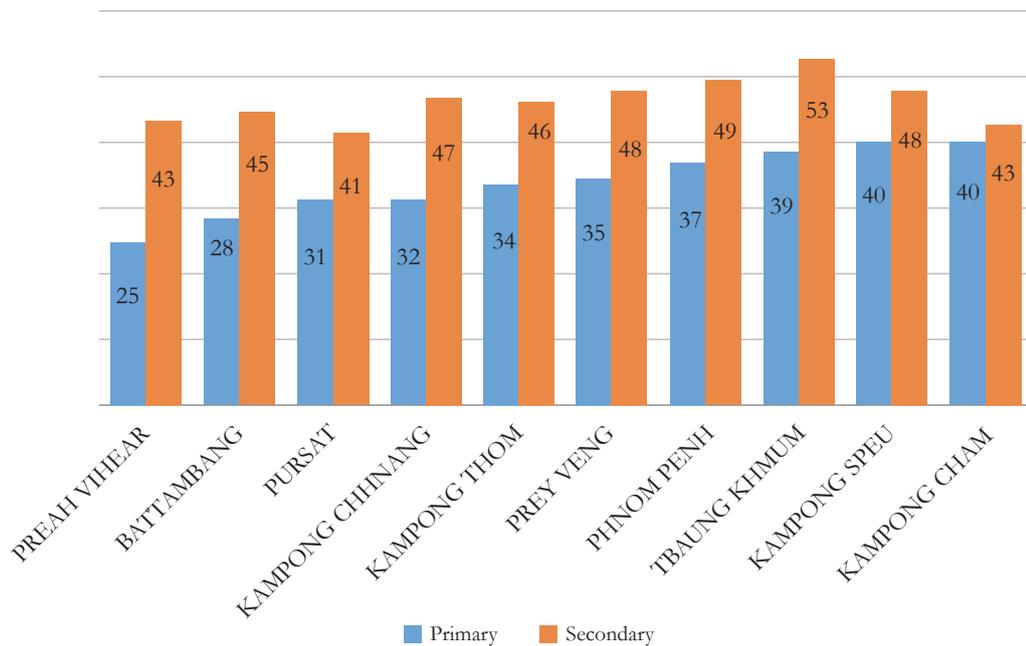
Student enrollment in the sample schools varied by province, level, and school type (Table 6). In every province, standalone primary schools were on average half the size of those with attached ECEs, and junior secondary schools were about two-thirds the size of full secondary schools. Average size varied considerably among provinces. Average primary school size varied from 200 in Preah Vihear to 1,026 in Phnom Penh, a fivefold difference. The differences were nearly as great among secondary schools, from 404 in Preah Vihear to 1,728 in Phnom Penh. Preah Vihear, Battambang, Kampong Chhnang, and Pursat had small schools at both the primary and secondary levels.

Table 6: Sample Schools' Average Enrollment by Province and Type

Province	Primary school	Primary school with ECE	All primary schools	Lower secondary school	Full secondary school	All secondary schools
Battambang	186	326	252	295	980	432
Kampong Cham	256	478	404	322	1,161	574
Kampong Chhnang	154	344	255	241	1,193	431
Kampong Speu	256	480	361	514	1,018	766
Kampong Thom	186	332	267	288	1,012	650
Phnom Penh	471	1,137	1,026	883	2,291	1,728
Preah Vihear	100	300	200	233	1,089	404
Prey Veng	333	332	332	400	1,257	743
Pursat	135	293	240	395	601	457
Tbaung Khmum	279	645	413	227	1,340	783
Total	217	490	375	353	1,282	697

A primary indicator of quality in schooling is the ratio of students to classes, classrooms, and teachers. These three ratios reflect the actual educational experience of the students. The average class size (the ratio of students to classes) determines many things about the students’ day-to-day school experience and the costs of schooling. Larger class size may reduce the amount of one-on-one teaching time with individual students, but it may also provide stimulus and opportunities for cooperation and competition not found in very small classes. Large classes reduce school costs as they distribute teachers’ salaries (the largest single cost in schooling) over more students. Primary school classes ranged from 25 in Preah Vihear to 40 in Kampong Speu and Kampong Cham. Average secondary class sizes were considerably larger (Figure 3).

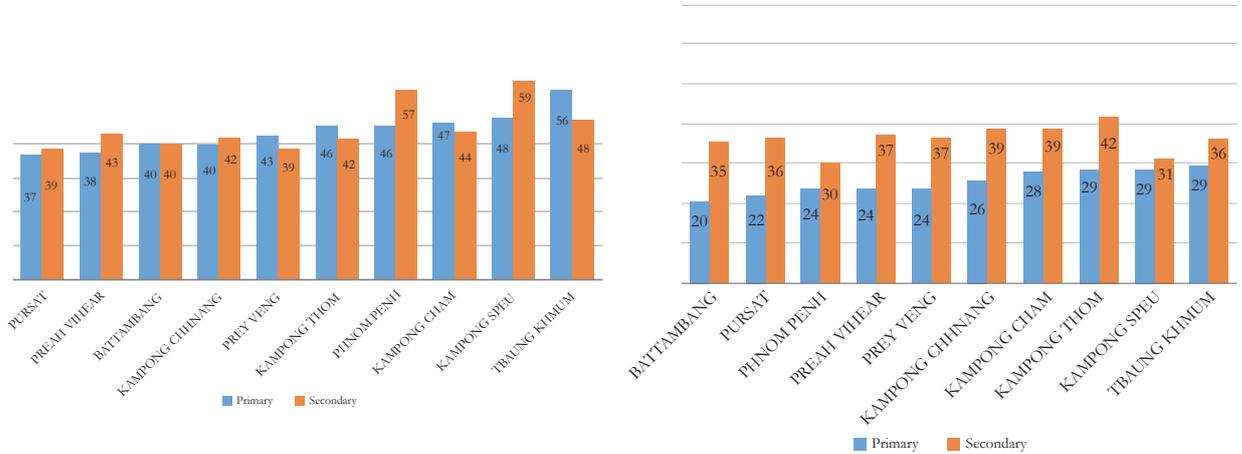
Figure 3: Average Class Size by Province and School Level



When compared with student-class ratios, the student-to-classroom ratio reveals if there are serious problems with the number of classrooms available or if there are surplus classrooms. The student-classroom ratio for primary students suggests that most provinces had classroom shortages, as the student-classroom ratio was larger than the student-class ratio (compare Figures 3 and 4). The difference was not so great at the secondary level, suggesting that classroom provision at that level was not so poor. However, there is often the need for more specialized classrooms at the secondary level for subjects such as science, so in a well-furnished system, one would expect the student-classroom ratio to be lower than the student-class ratio. Six of the ten provinces did have lower student-classroom ratios than student-class ratios at the secondary level.

Figure 4: Student-Classroom Ratios by Province and Level, with and without shift adjustment

Note: Left figure without shift adjustment; right figure with shift adjustment.

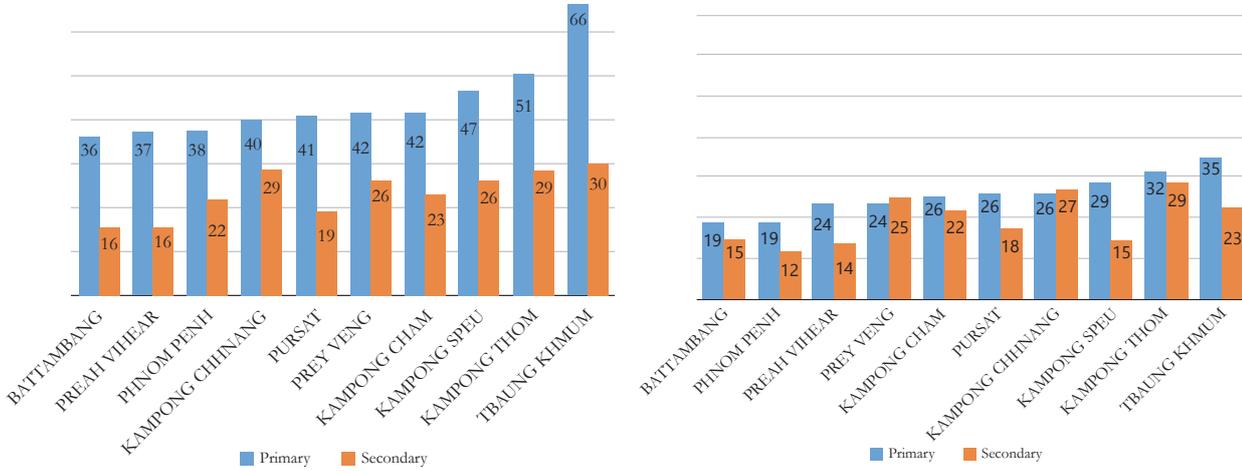


Adjusting the student-classroom ratio to take the number of shifts into account changes the picture considerably (Figure 4 above). Running two shifts effectively doubles the number of classrooms available for the same number of students and thus halves the student-classroom ratio. On average, primary schools in all ten provinces had between 20 to 30 students per classroom once shifts are taken into account. Similarly, at the secondary level, eight of ten provinces had an average number of 40 students or more per classroom without accounting for shifts. Once shifts are taken into account, only Kampong Thom had an average number of students per classroom of 40 or more.

A similar pattern was observed in the ratio of students to government teachers (Figure 5). In terms of class preparation and classroom management, the shift-adjusted ratio shows what the teacher faces in the classroom. Shift-adjusted student-teacher ratios for primary schools were generally between 20 to 30 students, although Kampong Thom and Tbaung Khmum were above 30 even when shifts are taken into account. In terms of grading and other student-related tasks, the unadjusted ratio is the key figure, when the same teachers take both shifts as is usually the case. Interpreting the figures for secondary schools is not so simple, as secondary teachers are usually subject specialists and are more likely to face classes on the order of the student-class ratio in Figure 3. Nonetheless, when shifts are a part of the school day, the average number of students in the secondary classroom is reduced.

Figure 5: Student-Teacher Ratio by Province and Level, with and without shift adjustment

Note: Left figure without shift adjustment; right figure with shift adjustment.



The use of double shifts may compensate for a lack of classrooms or lack of sufficient teachers, but it also reduces the amount of instructional time available to students. Typically, the shifts run as morning and afternoon sessions. Although schools start early and finish late, there is insufficient time for a full day of instruction. The literature strongly indicates that instructional time is positively correlated with more and better learning.⁵ One of the Ministry’s policy aims is to reduce double shifting, but the practice is so widespread that it is difficult to see a significant reduction taking place in the near future, particularly in primary schools.

School Directors

Male and female school directors differed on several characteristics (Table 7). Female directors were likely to have smaller schools and schools in rural areas, but lower student-teacher ratios. They were less likely to manage a disadvantaged school. In terms of social characteristics, female directors were more likely to be older than their male counterparts but less likely to be married and had fewer children of their own on average. Primary directors typically went to post-secondary college for their training, while secondary directors attended a higher education institution and received a Bachelor’s or Master’s degree. The largest proportion of school directors lived a kilometer or less from their schools and typically, apart from female primary school directors, took less than 15 minutes to travel to and from school, with the great majority traveling by motorcycle (moto).

5 See for example Cattaneo, M et al. 2016 and Lavy 2014.

Table 7: Characteristics of School Directors by Gender and Level

Item	Primary female director	Primary male director	Secondary female director	Secondary male director	All Directors
School characteristics					
Number	54	245	8	91	398
Pct disadvantaged	46%	55%	25%	40%	50%
Pct rural	85%	78%	88%	75%	79%
Average number of students	325	388	593	713	458
Average number of teachers	11	11	37	32	16
Average Student:Teacher ratio	43	44	19	24	39
Social characteristics					
Mean age	43	42	49	43	43
Pct married	70%	83%	88%	91%	83%
Mean number of children	2.6	3.2	2.9	2.8	3.0
Educational background					
To Year 12 only	13%	9%	0%	5%	8%
Post secondary college	59%	62%	25%	35%	55%
National Institute of Education	0%	0%	0%	8%	2%
Higher Education to Bachelor's degree	17%	22%	50%	32%	24%
Master's degree	6%	3%	13%	16%	7%
Location relative to school					
Percent travel less than 15 min to school	59%	74%	75%	70%	71%
Percent less than 1 kilometre to school	46%	45%	38%	44%	45%
Pct travel to school by moto	70%	84%	100%	79%	81%

School support committees

The effectiveness and function of school support committees appear unclear. Some of their members even disagree on committee size. Every school has a school support committee (SSC), a joint school-community committee responsible for school planning and budgeting and for overseeing spending of the operational funds. At each school, the interviewers were requested to meet two members of the school support committee from the community. A total of 722 separate interviews were conducted.⁶ Initial analysis revealed that the respondents were not in agreement on the size of the SSC to which they belonged. In about one-third of the cases in which two SSC members were interviewed, they did not agree on the number of members in the committee and often on the number of women on the committee (Table 8). Primary school members were more likely to agree, and rural primary schools had the most agreement.

6 Interviews could not be arranged for 12 schools. In 50 schools, only one interview could be conducted.

Table 8: Interview Status of SSC Members by Level and Location of School

SSC Interviews	Primary urban	Primary rural	Secondary urban	Secondary rural	All Schools
No SSC interview	1	7	1	3	12
One single SSC interview	9	30	3	8	50
Two interviews with agreement on numbers	31	143	11	36	221
Two interviews with differing numbers	21	58	9	29	117
Total	62	238	24	76	400

Women appear to be underrepresented in the SSC. The average SSC had about six members, with 20 percent being female (Table 9). Secondary rural schools had the largest committees, while secondary urban schools had the smallest. The latter also had the smallest proportion of women members, while primary urban schools had the largest proportion.

Table 9: SSC Membership by Location and Level

Item	Primary urban school	Primary rural school	Secondary urban school	Secondary rural school	All Schools
Average SSC membership	5.4	5.8	4.3	7.4	5.9
Average number of women members	1.5	1.3	0.7	1.8	1.4
Percent women members	24	20	13	22	20

Note: Only responses from schools with two members in agreement or one single interview were used in this table.

Teachers

Most teachers had completed education at the post-secondary level. Seven out of ten teachers had been trained at a provincial or regional post-secondary college. More than one-third of the secondary teachers had a degree at the Bachelor or Master level. A minority of about one in twenty teachers had only a 12th grade education or below.

Most teachers in the surveyed schools sample were “local” in terms of location and were a part of the geographical community served by their school. Seven in ten of the teachers lived within 15 minutes of their school, and a large minority took less than 15 minutes to get to school from home. Eight out of ten traveled between home and school by motorcycle (Table 10).

Table 10: Teacher Characteristics

Item	Primary female teacher	Primary male teacher	Secondary female teacher	Secondary male teacher	All government teachers
Social characteristics					
Number	295	289	54	141	779
Mean age	35	36	32	36	35
Percent married	65%	75%	67%	74%	70%
Mean number of children	1.4	2.0	1.2	1.9	1.7
Educational background					
To Year 12 only	9%	6%	4%	2%	6%
Post-secondary college	79%	78%	60%	51%	72%
Higher Education to Bachelor's degree	8%	15%	33%	36%	18%
Master's or Doctorate degree	0%	0%	0%	4%	1%
Location relative to school					
Percent travel less than 15 min to school	70%	72%	73%	72%	71%
Percent less than 1 kilometer to school	46%	42%	44%	39%	43%
Pct. travel to school by moto	74%	79%	81%	85%	79%

Most teachers had received some degree of training prior to starting their teaching careers. Nearly all teachers in the sample (97 percent) had completed teacher training, with the primary teachers having generally (77 percent) completed two years of training at a provincial teacher's college and nearly all the secondary teachers completing two years of training at a regional college (Table 11). They generally viewed their pre-service training as having been of good or very good quality (86 percent). They were experienced teachers with an average of over 12 years of teaching.

Table 11: Teaching Career

Item	Primary female teacher	Primary male teacher	Secondary female teacher	Secondary male teacher	All government teachers
Pre-service training					
Completed teacher training before teaching	95%	95%	100%	100%	97%
Training location: Provincial teacher's college	96%	95%	2%	11%	71%
Training location: Regional teacher's college	3%	5%	98%	87%	29%
Two or more years of training	77%	77%	90%	85%	80%
Years of experience	12.0	13.4	9.4	13.2	12.5
Pre-service training quality good/very good	88%	84%	96%	84%	86%
In-service training					
Received some in-service training	57%	59%	48%	62%	58%
Years since last in-service training	4.7	4.1	7.2	5.6	4.8
Percent received in-service in last three years	66%	68%	44%	49%	62%
In-service training quality good/very good	94%	90%	88%	87%	91%

Item	Primary female teacher	Primary male teacher	Secondary female teacher	Secondary male teacher	All government teachers
Training was applicable to teaching	98%	96%	96%	93%	96%
Teaching experience					
Years at this school	11.7	11.4	9.3	11.0	11.3
This is preferred school	83%	83%	77%	75%	81%
Taught at another school before this	45%	58%	40%	59%	52%
Want to move in near future	34%	34%	38%	28%	33%

Most surveyed teachers who had received in-service training viewed it as good or very good (91 percent) and applicable to their teaching (96 percent). However, only about three in five said they had received any in-service training. Of these, two-thirds of the primary teachers had received some in the last three years, compared to less than half of the secondary teachers. Eight in ten teachers said their current school was their preferred school, and their average time at this school was 11 years. Half had been at another school before their current school, and one-third wanted to move to another school in the near future (Table 11).

Secondary students

Most secondary school students live with their guardians in the same village where they were born, and half of them live within 15 minutes of travel from their schools. In each of the 100 secondary schools, 15 students were randomly selected from Grade 9 for interviews, so a total of 1,500 students were interviewed. The average age of secondary school students was 15.3 years, and 53 percent were female. The students overwhelmingly lived with their guardian (94 percent), and a majority lived in the same village where they were born (82 percent). A little less than half of the students traveled more than 15 minutes from home to school, and about half of them traveled to school by bicycle while another one-third traveled to school by motorcycle. Disturbingly, only half ate breakfast every day (Table 12).

Table 12: Secondary Student Characteristics

Item	Girls	Boys	All students
Number	789	711	1,500
Mean age	15.2 yrs	15.4 yrs	15.3 yrs
Family size at home	5.4	5.5	5.4
Living with guardian	93%	94%	94%
Born in current village	81%	82%	82%
Travel 15 minutes or less to school	52%	59%	55%
Travel by bicycle	52%	50%	51%
Travel by moto	31%	32%	32%
Eat breakfast every day	51%	55%	53%

A sizeable proportion of the secondary students interviewed were over-age for their grade. If the students commenced school at age 6 as they should, then they should be 15 years old in Grade 9. However, about two in five were age 16 or above, which suggests that they started school late or repeated at least one grade (Figure 6 and Table 13). Boys were more likely than girls to be over-age for Grade 9 and to have repeated at least one grade.

In terms of learning resources, four out of five children shared textbooks in class (Table 13). Four out of five children shared textbooks in class with other students, but nearly all students took at least some textbooks home. Students were also likely to have other books at home for reading, with most having one to five reading books at home. Most students (74 percent) took private tutoring classes at school, and around 43 percent had private tutoring outside school. Only a small minority of about 15 percent had no tutoring classes at all.

Figure 6: Grade 9 Students' Age by Gender

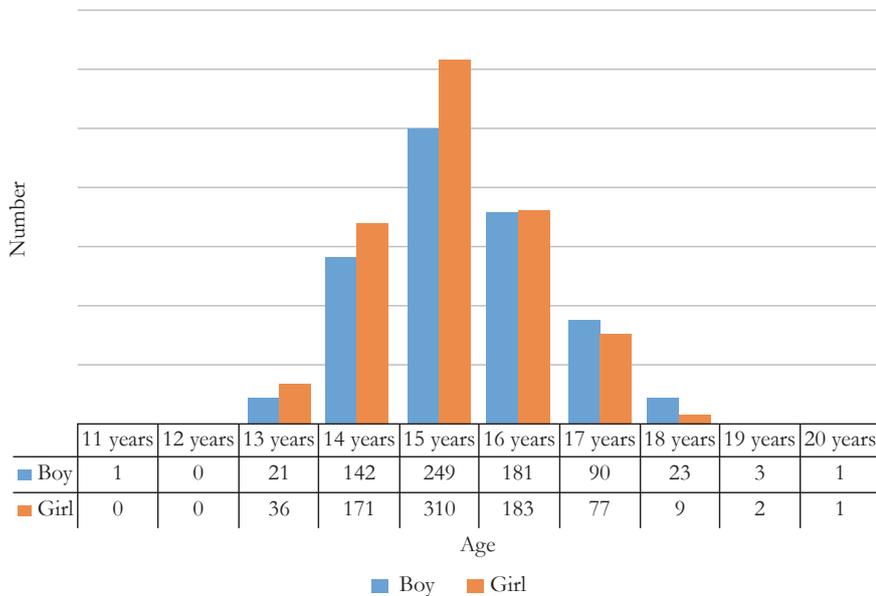


Table 13: Secondary Students' School Experience

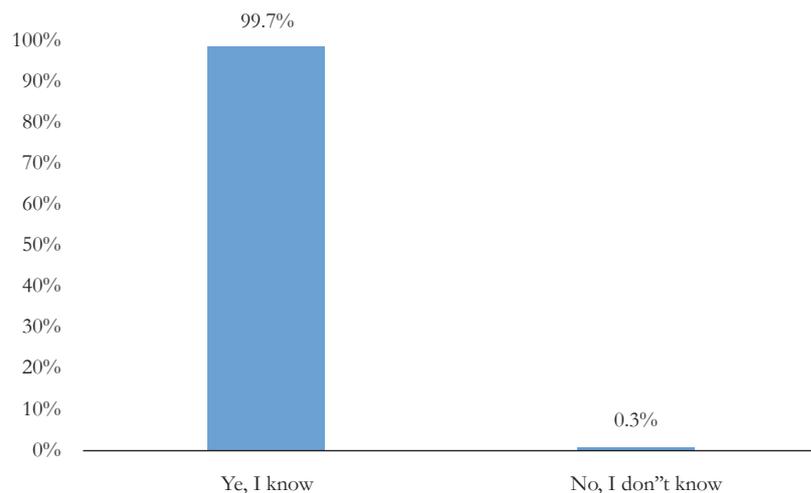
Item	Girls	Boys	All students
Over-age for grade	35%	42%	38%
Under-age for grade	26%	23%	25%
Ever repeated grade	14%	18%	16%
Share textbooks	80%	76%	78%
Take textbooks home	98%	97%	97%
1 to 5 books for reading at home	63%	59%	61%
In-school tutoring	74%	73%	74%
Out-of-school tutoring	43%	42%	43%

4 Education revenues and funding

Flow of funds to schools

Almost all school accountants knew the amount of SOB to which their schools were entitled. This implies that schools know if there are shortfalls in the amount of funds transferred to their bank accounts. In the survey, school accountants were asked, “Do you know how much this school is entitled to receive PB/SOB?” to which 399 of the 400 sampled schools (99.7 percent of all schools) answered, “Yes, I know it” (Figure 7).⁷ Only one school—a primary school in Prey Veng province—answered “No, I don’t know.”

Figure 7: Knowledge of SOB Amounts by Person Responsible for Accounts

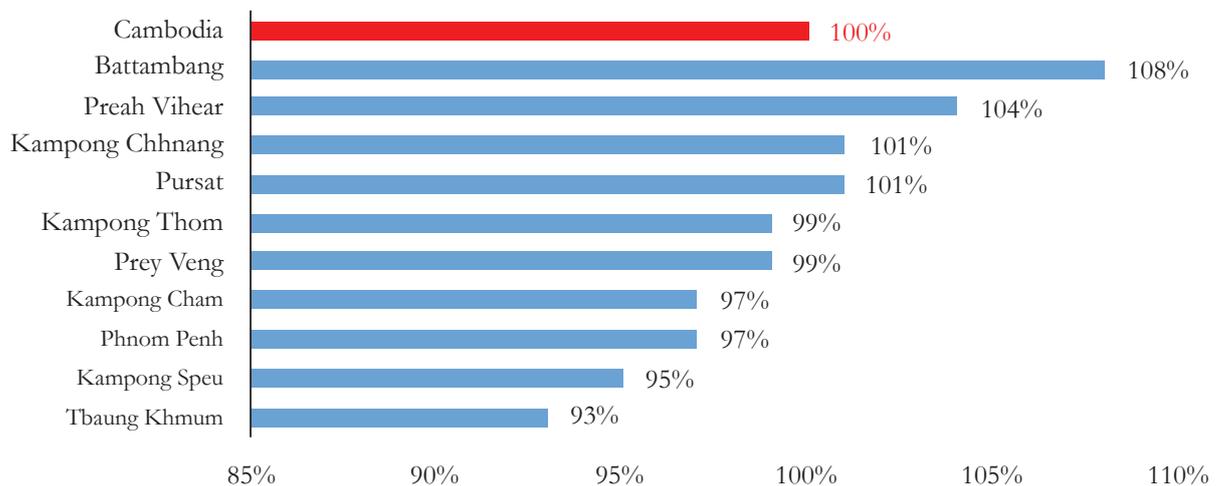


⁷ POEs supplied details of SOB transfers by quarter for all sampled schools. Interviewers also calculated SOB entitlements using the formula in Table 1. At the school, this question on knowledge of funds transferred was followed by specific requests for the amount in riel. Thus, the answer was verified using three-way triangulation.

Flow of SOB funds

Schools in the study's sample received the full amount of SOB funds they were supposed to get, which indicates no leakages as the funds were transferred. Following the implementation of SOB fund transfers via bank accounts in late 2014, funds were transferred from bank accounts of the provincial treasuries to bank accounts of the POE, then the POE made transfers to bank accounts of their respective schools. In tracing fund flows in ten provinces⁸ selected randomly for this study, it was found that in each quarter of fiscal years 2015 and 2016, POEs received all the funds to which they were entitled from their respective provincial treasuries. Tracing the funds from POEs to schools in the ten provinces also revealed that schools received the full amount of funds to which they were entitled (Figure 8, Tables 14, and 15).

Figure 8: SOB Funds Sent and Reported, Fiscal Year 2015

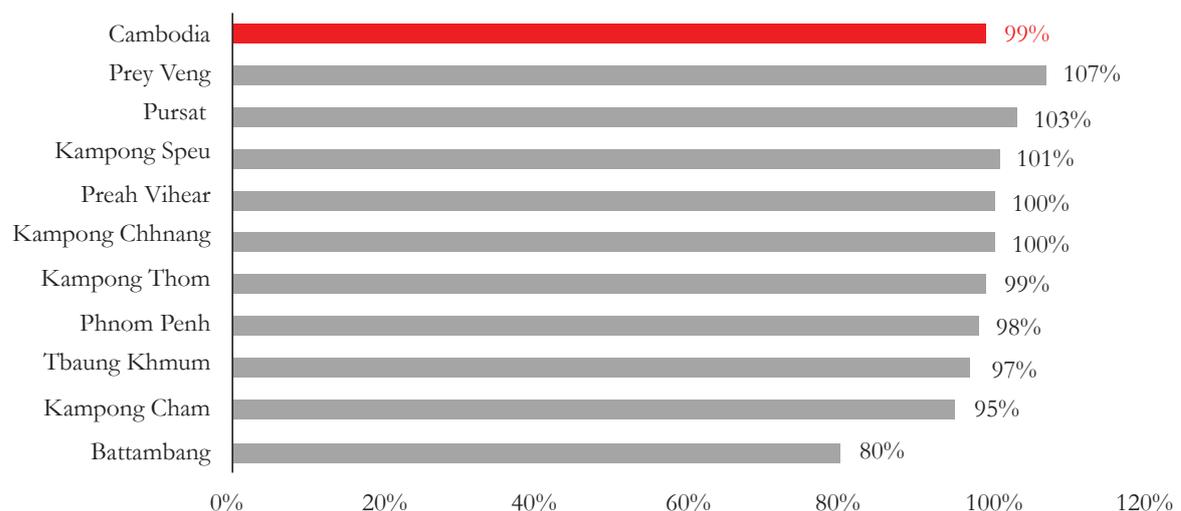


8 Battambang, Kampong Cham, Kampong Chhnang, Kampong Speu, Kampong Thom, Phnom Penh, Preah Vihear, Prey Veng, Pursat, and Tbaung Khmum

However, the study found that schools in some provinces either over-reported or under-reported the amount of SOB funds they received in 2015. As Figure 8 shows, schools in some provinces reported receiving more funds than the amount reported as sent by the POE, while some other schools reported less than the amount reported by POE. For example, in 2015, schools in Battambang reported receiving 8 percent more than what was sent by the POE, while schools in Tbaung Khmum reported receiving 7 percent less than the amount of funds reported sent by the POE (Figure 8).

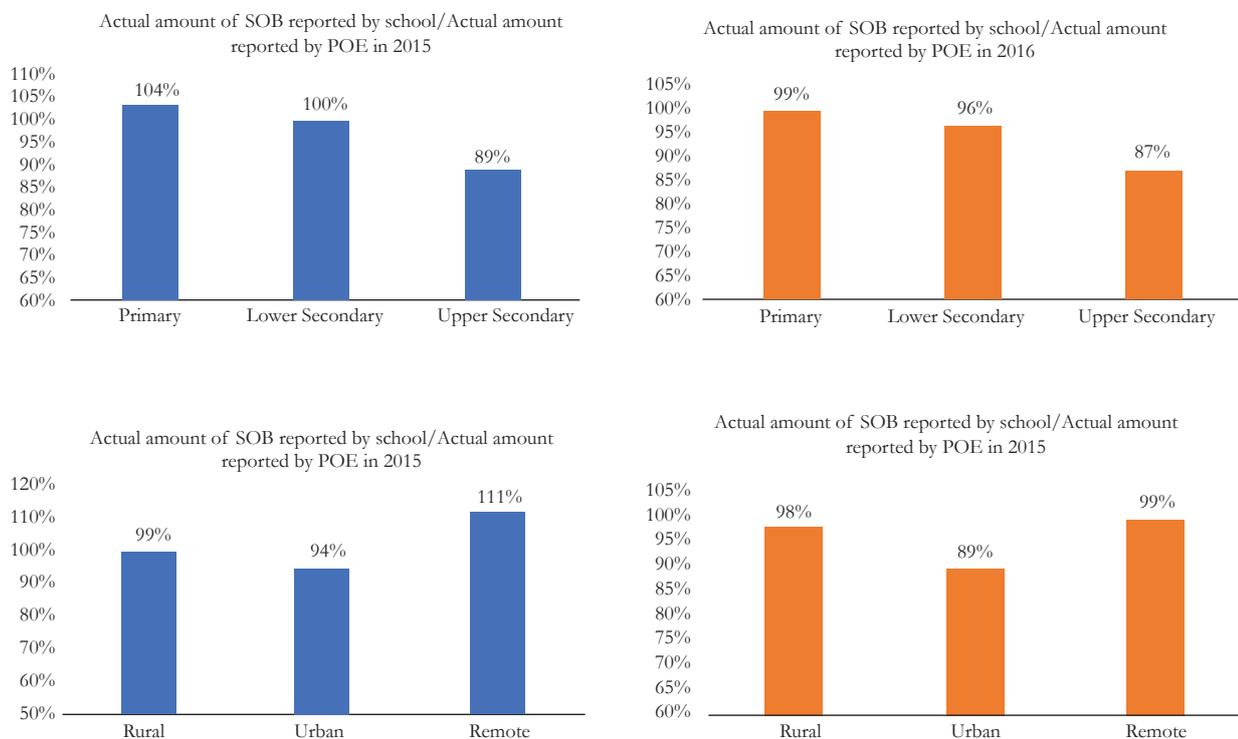
Over-reporting and under-reporting of funds were still found in 2016, suggesting that poor recording of finances is an issue that needs to be addressed at the school level. Out of the study's ten provinces, only schools in two provinces (Kampong Chhnang and Preah Vihear) were found to have reported their funds correctly (Figure 9).

Figure 9: SOB Funds Sent and Reported in Fiscal Year 2016



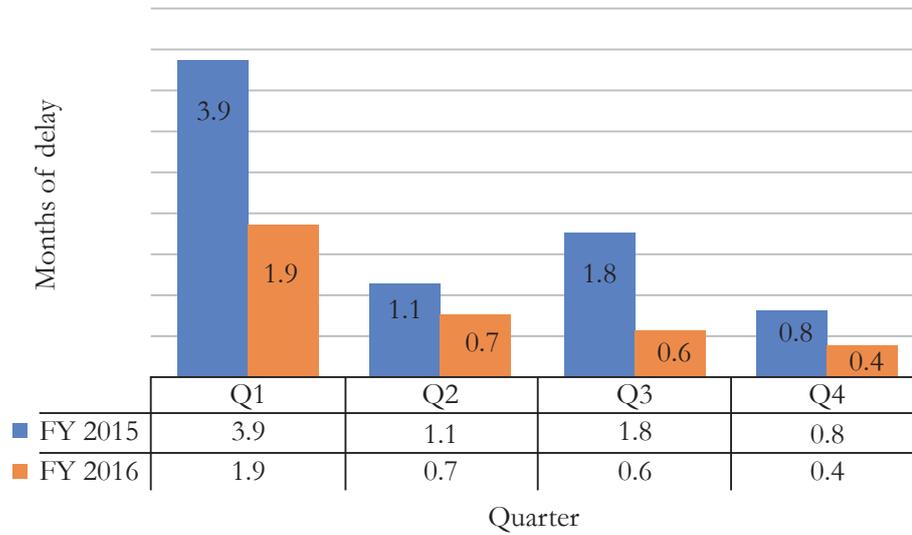
No single pattern of poor financial recordings by school type or location can be identified from 2015 to 2016. There are no indications that secondary schools do better than primary schools, nor do schools in urban areas do better than schools in rural and remote areas with regard to proper recording of their finances (Figure 10). The PETS survey showed that in 2015, primary schools tended to over-report their receipt of SOB funds, while upper secondary schools tended to under-report. However, in 2016, primary, lower secondary, and upper secondary schools under-reported their funds. The survey also showed that in 2015, schools in remote areas tended to over-report SOB funds while schools in rural and urban areas tend to under-report. In 2016, all schools regardless of location under-reported the funds.

Figure 10: SOB Amounts Sent/Received by Level and Location of School



Although SOB funds have reached schools without significant leakages, the main challenge is the major delay in disbursement at the beginning of the fiscal year, which could result in inefficient funds usage. Schools expected to receive their first wave of funds in January but received it several months later—for example, in April/May 2015 and February/March 2016 (Figure 11). Without funds early in the school year and with most schools having limited or no reserves, school directors have limited options. They may simply delay purchases of oftentimes essential school supplies which disadvantages their students, or they may buy on credit or borrow funds. Both latter options increase the costs of purchases, often considerably. Local merchants who know they may wait several months for payment build the costs of the delay into their prices, while borrowing informally may mean interest charges of 2 percent or more per month. Another alternative is to use SIG funds, which normally arrive early in the first quarter. Some purchases can be legitimate under SIG, while others may mean transfers between SOB and SIG accounts to balance the spending and the books. Unifying these funds as MoEYS is planning, into one SIF with a single account, may improve this situation.

Figure 11: Average Months of Delay from Start of Quarter in POE Request for SOB Transfers



The significant delay in fund transfers to schools at the beginning of each fiscal year is likely due to systemic problems. The longest delays in making fund requests from POEs to provincial treasuries in 2015 were in Phnom Penh and Pursat provinces, where the POEs made the fund requests to their respective provincial treasuries on May 5th and 7th. For the other eight provinces, POEs made the fund requests to their provincial treasuries in April—also a long delay given that funds for the first quarter should have been processed in January 2015. The delay in 2015 was due in part to the introduction of full program budget, which required some adjustment. The situation improved in 2016, although there was still an average delay of 1.9 months (Figure 11).

The delay can be attributed in part to budget request and approval processes. The procedures for fund request and release at the Ministry and provincial levels involve making a request to the provincial treasury. However, in the first quarter, the POE must wait until they receive the budget book and Prakas from the MEF and the latest enrollment data from all schools in the province for fund adjustments due to enrollment changes. Once the requests are made, fund releases are relatively quick, and the complete cycle takes only a few days from request to receipt (Figures 12 and 13).

Figure 12: SOB Fund Processing Times for POE to PT and PT to POE

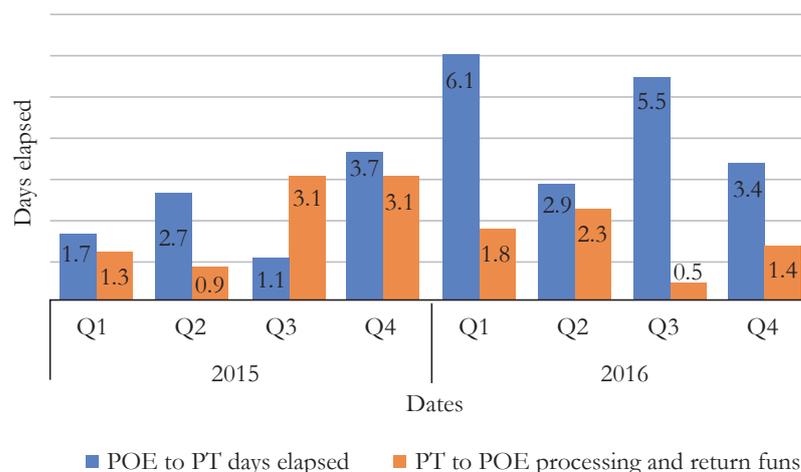
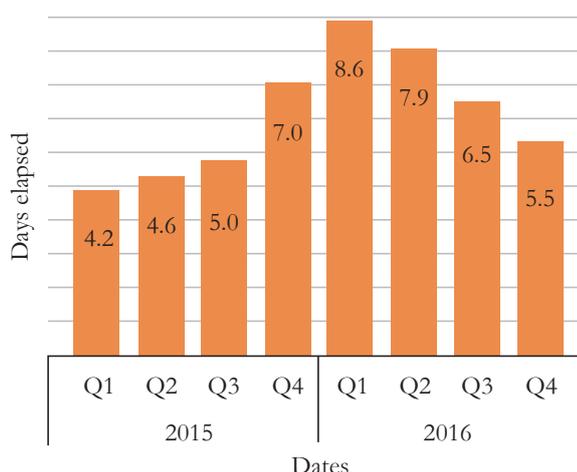


Figure 13: Turnaround Time from POE back to POE



The delay in fund disbursement also occurred in the third quarter of the year, which is the third tranche of SOB fund releases. The delay was observed in all ten provinces in the study’s sampled provinces. Although the quarter commenced on July 1st, the POEs in 8 provinces⁹ only made fund requests to their respective provincial treasuries in August. The POEs in Phnom Penh and Tbaung Khmum did not make fund requests until September. It is unclear why the process of making fund requests from POEs to provincial treasuries for the third quarter of 2015 did not start in June given that POEs do not need to wait for the necessary documents and information (e.g., the budget book and enrollment data) to process fund requests to provincial treasuries.

Previous PETS identified rigidity in SOB subaccounts, which remains an ongoing challenge. There are now 12 subaccounts in two SOB chapters (60 and 61) in which government funds flow to schools and in which the schools have to account to their respective POE. Most schools receive their funds allocated to the

9 Battambang, Kampong Cham, Kampong Chhnang, Kampong Speu, Kampong Thom, Preah Vihear, Prey Veng, and Pursat

subaccounts even if these amounts do not reflect the needs of specific schools (e.g., they may receive funds for paying for electricity even though the school is not connected). Moving funds between these lines is necessary to spend the budget on identified needs at the school level. However, this is difficult and time-consuming, taking many weeks or even months.

Flow of SIG funds

The process for SIG fund releases differs from that of SOB funds (as noted in Figure 1). As described in the manual, SIG procedures involve a direct flow of funds from the center to the school account, initiated by the Finance Department of the MoEYS. Disturbingly, however, the provincial offices reported a number of release routes. While some indicated that the funds flowed from the MoEYS Finance Department as per the procedures, others said funds came through the provincial treasury or POE account. Overall, schools received the full amount of funds to which they were entitled.

However, as with SOB, there are issues of poor recording at schools. For the 2014-15 school year, some schools over-reported or under-reported the amount of SIG funds (Table 16). Schools in Pursat, Prey Veng, Kampong Cham, and Battambang provinces over-reported the amount of SIG funds they received from the MoEYS Department of Finance, as their records showed they received more than 100 percent of the funds compared to the amount of funds recorded and provided by the POEs. Schools in Kampong Chhnang, Tbaung Khmum, Phnom Penh, and Kampong Speu under-reported the amount of SIG funds they received, as their records showed that they received less than 100 percent of the funds compared to the amounts recorded and provided by the POEs. The pattern of differential recording was repeated in the 2015-16 school year, with a similar overall pattern and most provinces reporting in a similar manner (Table 17). Similar to SOB, there is also no clear pattern of poor recording in terms of school type and location for SIG funds.

Table 16: Average SIG Amounts per School Reported by POE and School 2014/15

Province	Average amount of SIG reported by POE 2014-2015	Average amount of SIG reported by school accountant 2014-2015
Battambang	678	689
Kampong Cham	876	901
Kampong Chhnang	777	771
Kampong Speu	1,044	1,004
Kampong Thom	827	827
Phnom Penh	2,160	2,124
Preah Vihear	733	731
Prey Veng	869	905
Pursat	660	690
Tbaung Khmum	1,087	1,072

Table 17: Average SIG Amounts per School Reported by POE and School 2015/16

Province	Average amount of SIG reported by POE 2015-2016	Average amount of SIG reported by school accountant 2015-2016
Battambang	685	685
Kampong Cham	867	889
Kampong Chhnang	752	747
Kampong Speu	1,008	1,012
Kampong Thom	824	820
Phnom Penh	2,135	2,128
Preah Vihear	751	729
Prey Veng	859	886
Pursat	700	703
Tbaung Khmum	1,077	1,059

As with SOB, disbursement of SIG was also delayed. Schools are supposed to receive SIG funds in November, the beginning of the school year. Schools in some provinces received their SIG funds in December, while others received their SIG funds in January, February, April, May, or as late as July. There was little or no improvement in the timeliness of fund receipts between school year 2014-2015 and 2015-2016 (Table 18).

Table 18: SIG Receipt Date 2014-15 and 2015-16

Province	Schools received SIG funds 2014-2015	Schools received SIG funds 2015-2016	Difference
Battambang	April 2015	July 2016	3 months later
Kampong Cham	December 2014	January 2016	1 month later
Kampong Chhnang	December 2014	January 2016	1 month later
Kampong Speu	February 2015	March 2016	1 month later
Kampong Thom	January 2015	February 2016	1 month later
Phnom Penh	January 2015	January 2016	Same
Preah Vihear	May 2015	February 2016	3 months earlier
Prey Veng	May 2015	January 2016	4 months earlier
Pursat	February 2015	February 2016	Same
Tbaung Khmum	December 2014	January 2016	1 month later

5 Quality of service delivery in education

Assessing the impacts of SOB and SIG spending on quality of education at the service delivery point of the school is complex. First, it is necessary to consider how quality in schools can be measured. Quality has numerous aspects, including the general state of the school, quality of the teachers and their teaching, and management of the school, including its finances. Spending can also be assessed in various ways, including the total amount available to the school, amount available per student, and amount spent on quality-related goods and services such as teaching aids, library resources, and environmental aspects. Linking spending to quality outcomes is rarely a simple or straightforward exercise.

School spending

Two approaches to assessing quality of service delivery are used in this analysis. The first is related to total amount of fund available to school. The second is related to the amount spent on quality.

The total amount available to the school in SOB and SIG is a significant determinant of what the school can do to affect educational outcomes. School and POE perceptions are that the use of SOB funds is more inflexible than that of SIG funds. The perception is that SOB funds are predetermined in the budget lines issued to schools and can only be changed after lengthy and formal approaches. On the other hand, SIG funds are perceived as lump sums that can be used flexibly according to the school's needs and against a list of permitted uses—broadly, administration, access, and quality. Nonetheless, the total funding available is important, since even if SOB funds are more inflexible, SIG funds can be spent to make up for shortfalls or cover necessary school improvements.

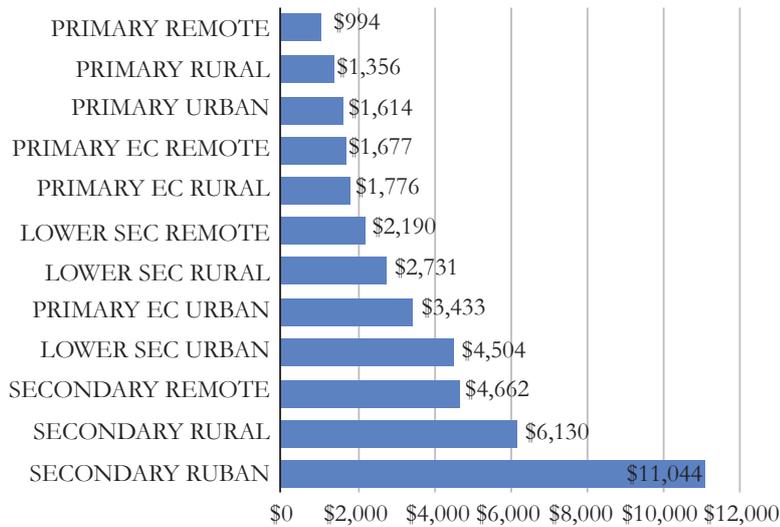
The total operational funds available to schools (SOB and SIG combined) ranged from USD 248 to USD 25,833. Both SOB and SIG funding calculations include lump sums plus per capita components designed to offset the disadvantages suffered by small schools, while preserving uniform per capita payments. Half of all schools are classified as disadvantaged and thus receive extra operational funding. The average across all schools in the sample was USD 2,629 (Table 19). For analytical purposes, the 400 schools were assigned to quintiles based on their total reported operational funds received. Schools in the lowest quintile received USD 765 on average and were all primary schools. Schools in the highest quintile were mainly secondary schools and received an average of USD 6,715 in 2015-16. Standalone primary schools received an average of USD 1,278, while those with attached ECEs received an average of USD 2,270. Junior secondary schools received a total of USD 2,946 on average, and full secondary schools received USD 7,910 (Table 19).

Table 19: Average Total Operational Funds (SOB+SIG) Received in 2015-16, by Quintile and Level

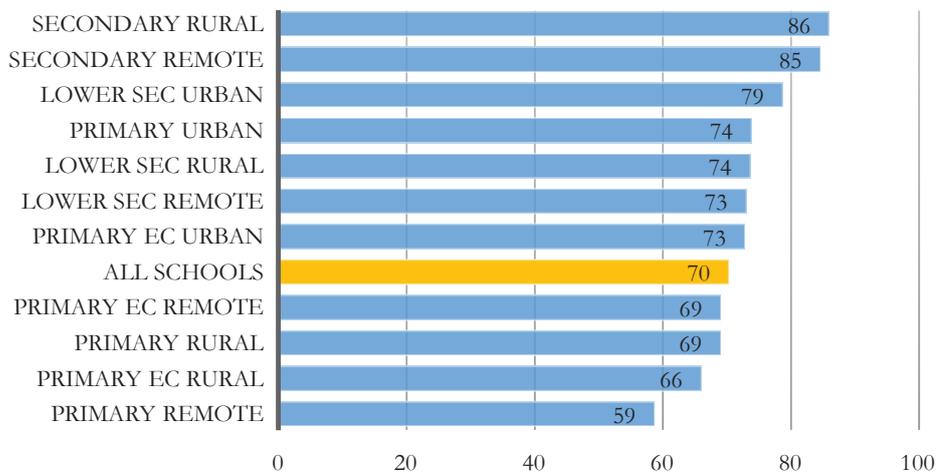
Operational fund quintiles	Primary		Secondary		All schools
	Stand alone	With ECE	Lower	Full	
Quintile 1	\$714	\$891			\$765
Quintile 2	\$1,342	\$1,332	\$1,353		\$1,338
Quintile 3	\$1,733	\$1,803	\$1,926	\$1,730	\$1,815
Quintile 4	\$2,509	\$2,495	\$2,536	\$2,648	\$2,512
Quintile 5		\$5,683	\$5,002	\$8,401	\$6,715
All schools	\$1,278	\$2,270	\$2,946	\$7,910	\$2,629

Note: 385 schools had sufficient data to be included.

For most quality issues, the total amount available is the key factor. This is related to the ability to invest in school quality both in terms of physical environment and supporting learning outcome. The average total operational funds available to a school is strongly linked to school level and location. Primary schools in a remote area received the lowest average operational funding while secondary schools in urban area received the highest average operational funding (Figure 14).

Figure 14: Average Operational Funds Received by Type and Level of School

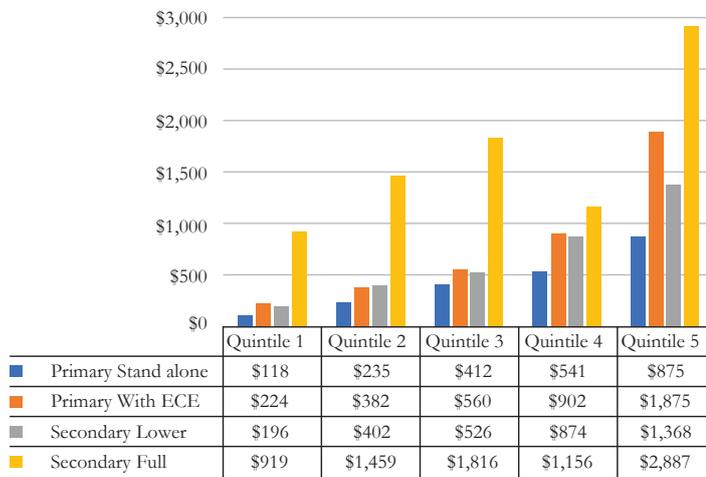
The proportion of SIG funds spent on quality aspects is also important in assessing management and community intentions to improve the school. Both school level and location were closely related to the percentage of SIG funds allocated to quality aspects. Total SIG funds reported to be spent on quality aspects in 2015-16 ranged from USD 17 to USD 7,359. The average across all schools was USD 757. While this may be a relatively small proportion of total operational spending in some schools, it supports activities that directly contribute to improving the quality of education.¹⁰ Across all schools, the average proportion of SIG funds spent on quality aspects was 70 percent. This varied from 59 percent spent on quality by standalone remote primary schools to an average of 86 percent spent by rural secondary schools (Figure 15).

Figure 15: Percent of SIG Funds Spent on Quality Aspects by School Type and Location

¹⁰ SIG quality funds can be spent on measures such as: (1) increase teaching and learning materials in the classroom; (2) introduce experimental and corner subject materials in the school; (3) increase library materials and rooms; (4) improve the school environment and playground to be clean and green; (4) initiate life skill practices, including agriculture; (5) support children with disabilities and vulnerable groups; (6) support slow learners and dropout prevention; (7) staff training and workshops; and (8) strengthen the quality and efficiency of school management. Unfortunately, the interview forms did not include these aspects separately so it was not possible to analyze the impacts of SIG quality spending in detail.

Choosing to spend a higher percentage of SIG funds on quality is a reflection of the value placed on quality aspects by the school. The percentage of SIG funding allocated to quality aspects is a school choice and is the responsibility of the SSC. SIG funds may also be spent on administration or on improving access to school. The impact of choice on spending is mediated by the total amount of SIG funds available to the school—a large proportion of a small amount may still be much smaller in total than a smaller proportion of a large amount. In practice, schools with smaller SIG amounts tended to allocate a smaller percentage of their funds to quality aspects, while schools with larger amounts of SIG funds allocated a larger percentage to quality.¹¹

Figure 16: Average SIG Amount Spent on Quality Aspects, by Quintile and School Type



The overall pattern of SIG quality spending by school level and quintile is similar to that for the receipt of operational funds. Schools were again divided into quintile categories based on the total SIG funds they spent on quality aspects (Figure 16). Spending by quintile ranged from USD 187 for the lowest quintile to USD 1,998 for the highest. Standalone primary schools spent the least on average (USD 357) while full secondary schools spent the most (USD 2,439). Schools in the lowest quintile spent much less on quality inputs than corresponding schools in the highest quintile. It seems clear that even with a high level of management skills and small school size, it is difficult to make an impact on educational quality when total spending is an average of USD 118 as it is with standalone primary schools in quintile 1, compared with the same type of school in quintile 5 which spent on average USD 875 for the same purpose (Figure 16).

Development of quality indices

The survey forms administered included several areas focused on quality aspects of Cambodian schooling. For example, the director form asked a range of questions about the school, its financial management, and human resource issues. The classroom observation form, which recorded observations in Grades 3, 5 or 8, and the school grounds contained more data that could be used to assess quality issues in the school. Four quality indices were developed to measure general school

11 There was a significant [0.000] correlation of 0.52 between the total SIG amount and the percentage allocated to quality.

quality, financial management quality, classroom quality, and environmental quality. It was hypothesized that the measures of school spending outlined in Section 5.1 would predict or correlate strongly with the quality indices.

School quality index

Ultimately, school quality—as measured by the educational achievement and personal growth of students completing any stage in their education—is a function of both the characteristics of the school and the socio-economic status of the community from which the students are drawn. Characteristics of the school that are important include management, teaching, and school environment. The index developed here refers mainly to operational quality across a number of observable indicators that are amenable to a single-visit survey approach. The school quality index has sixteen items and was developed from the director’s form, which covered many areas related to school functioning.¹²

It is recognized that some of the conditions related to school quality are not fully under the control of the school. For example, although electricity and drinking water are crucial to a safely functioning school of reasonable quality, they are not uniformly available in all districts of Cambodia. While school-based provision of these services through generators or solar systems or through bores and pumps is possible, it is not usually affordable, especially for small rural schools where the majority of the students’ households do not have them. However, other items such as recordkeeping are well within the reach of even very small schools.

Table 20: Items in the School Quality Index

1. Has School Development Plan	9. Library open to students
2. Has Teacher Attendance book	10. Has computers for students
3. Has Student Attendance book	11 Teacher absences not a problem
4. Has Library inventory	12. Adequate textbooks
5. One shift	13. Adequate learning materials
6. Has safe drinking water	14. Adequate student furniture
7. Has reliable electricity	15. Adequate maintenance resources
8. Has library	16. Adequate library resources

Common features in school quality related responses include availability of teacher attendance books and SDPs in most school, operation of more than one shifts, inadequate safe drinking water, and very limited availability of student computers. Teacher attendance book and SDPs are available in 84 percent and 87 percent of all schools respectively. Sixty two percent of all schools operated more than one shift. More than two out of three primary schools operated more than one shift, compared to only one in four lower secondary schools. Thirty seven percent of the lower secondary schools had safe drinking water. Only 6 percent of all schools had student computers (Table 21).

12 It covers several aspects of the school including recordkeeping (items 1, 2, 3, 4), human resources (items 2, 11, 5), physical aspects (items 6, 7, 14, 15), educational resources (items 10, 12, 13), and library resources (items 4, 8, 9, 16) (Table 20). These constitute a basic set of conditions and resources that all schools should ideally possess.

Table 21: School Quality Items, by School Type

School Quality Index items	Primary school	Primary school + ECE	Lower Secondary school	Full Secondary school	All schools
1 Has student computers	0%	3%	13%	33%	6%
2 Has adequate student furniture	28%	33%	32%	56%	33%
3 Has one shift	34%	24%	75%	58%	38%
4 Reliable electricity	26%	56%	48%	75%	47%
5 Has safe drinking water	45%	64%	37%	47%	52%
6 Students have library access	36%	75%	48%	69%	58%
7 Has adequate learning materials	59%	60%	49%	69%	59%
8 Has library inventory book	57%	68%	51%	58%	61%
9 Has library	37%	81%	54%	78%	62%
10 Has adequate maintenance funds	64%	69%	52%	78%	66%
11 Has Student Attendance book	69%	69%	57%	67%	67%
12 Has adequate textbooks	64%	68%	67%	81%	68%
13 Has adequate library resources	67%	72%	73%	83%	72%
14 Teacher absence not a problem	79%	85%	62%	75%	79%
15 Has Teacher Attendance book	75%	88%	84%	94%	84%
16 Has School Development Plan	79%	90%	92%	94%	87%

Responses to the school quality index items also differed significantly by area, namely between urban and remote schools (Table 22). Urban schools were more likely to have computers for students, have a library, give students access to the library, and have an SDP. However, the libraries may not have adequate resources. Remote schools were much less likely to have safe drinking water and reliable electricity, have a library and a library inventory, and have an SDP. Location did not seem to be a strong factor in the school having adequate student furniture, maintenance funds, and teaching materials; having one shift; keeping Teacher and Student Attendance books; and having few problems with teacher attendance.

Table 22: School Quality Items, by School Location

School Quality Index items	Urban	Rural	Remote	All schools
1 Has student computers	13%	4%	3%	6%
2 Has adequate student furniture	32%	34%	31%	33%
3 Has one shift	32%	41%	37%	38%
4 Reliable electricity	78%	44%	17%	47%
5 Has safe drinking water	69%	50%	37%	52%
6 Students have library access	78%	57%	36%	58%
7 Has adequate learning materials	57%	60%	56%	59%
8 Has library inventory book	70%	62%	47%	61%
9 Has library	82%	61%	40%	62%
10 Has adequate maintenance funds	68%	65%	67%	66%
11 Has Student Attendance book	73%	64%	67%	67%
12 Has adequate textbooks	58%	70%	71%	68%
13 Has adequate library resources	60%	75%	76%	72%
14 Teacher absence not a problem	84%	78%	73%	79%
15 Has Teacher Attendance book	92%	82%	81%	84%
16 Has School Development Plan	94%	88%	77%	87%

Financial quality index

The financial quality index has 12 items and covers items in the director's form and SOB records (Table 23). These items are part of the standard Ministry financial procedures and activities, and responsible school staff should have received training and manuals to cover them. Thus, all schools should be able to receive a high score on financial management practices. The survey did not investigate how well or poorly the school carried out these practices, so the index only reflects the extent to which the school could demonstrate its adherence to standard procedures.¹³

Table 23: Items in the Financial Quality Index

1. School has bank account	4. School follows MoEYS financial guidelines
2. School has budget process	5. School has consolidated budget proposal
3. School operating budget:	6. School has an approved SOB budget
a. Provided to School Support Committee	7. School has consolidated quarterly financial reports
b. Provided to community members on request	8. School has consolidated school performance checklist
c. Publicly posted	
d. Posted in available format to public	9. School knows SOB entitlement

It is recognized that there are reasons why some schools find it difficult to meet these standards. The principal reason is probably lack of training due to replacement of trained staff, as directors and senior school staff retire, are transferred, or promoted to other schools. Without a comprehensive plan to identify and train newcomers, accumulated knowledge and training slowly dissipates through attrition. Even with training, staff sometimes fail to implement the procedures they have been taught.

As might be predicted, all types of schools had positive responses on the items in the financial quality index. Indeed, for items 6 to 12 on the list, the scores by school type were uniformly high (Table 24). The lowest scores overall were for the accountability items in the index. These items were related to the availability and clarity of the school budget to the community and its representatives on the SSC. Only two in five schools of whatever type made the budget available to the community on request—the lowest response for any item in this index. About two-thirds made the school budget available to the SSC, who were supposed to be involved in developing it. About four in five posted the budget in a public place, although only slightly more than half of the lower secondary schools did so.

¹³ The Financial Quality index could thus be described as a measure of observed financial practices linked to good financial management as set out in standard government operating procedures.

Table 24: Financial Quality Items, by School Type

Quality Index items	Primary school	Primary school + ECE	Lower Secondary school	Full Secondary school	All schools
1 SOB budget available to community on request	42%	45%	37%	45%	43%
2 SOB budget provided to SSC	61%	56%	67%	75%	61%
3 SOB budget posted in a public place	72%	87%	56%	83%	77%
4 SOB budget presented in understandable format	88%	86%	71%	75%	83%
5 Has consolidated school performance checklist	85%	93%	86%	89%	89%
6 Has consolidated budget proposal for SOB	90%	89%	87%	92%	90%
7 Has consolidated report on SOB 2016	91%	94%	89%	92%	92%
8 Follows MoEYS guidelines	98%	97%	98%	97%	98%
9 Has consolidated quarterly report on SOB by subchapter	99%	100%	97%	97%	99%
10 Has budget process	98%	100%	100%	100%	100%
11 Has bank account	100%	99%	100%	100%	100%
12 Knows entitlement for SOB	99%	100%	100%	100%	100%

Similarly, compliance for most of the procedural items (6-12) in the financial quality index was high across all locations; however, remote schools were much less likely to be accountable to their community than urban schools (items 1-3 in Table 25). This is a concern given that remote communities are already likely to be disadvantaged in terms of resources and are less likely to be closely supervised by provincial and district staff due to travel difficulties.

Table 25: Financial Quality Items, by School Location

Quality Index items	Urban	Rural	Remote	All schools
1 SOB budget available to community on request	52%	42%	33%	43%
2 SOB budget provided to SSC	61%	63%	53%	61%
3 SOB budget posted in a public place	89%	76%	63%	77%
4 SOB budget presented in understandable format	86%	82%	84%	83%
5 Has consolidated school performance checklist	93%	89%	85%	89%
6 Has consolidated budget proposal for SOB	95%	87%	91%	90%
7 Has consolidated report on SOB 2016	95%	91%	91%	92%
8 Follows MoEYS guidelines	98%	98%	94%	98%
9 Has consolidated quarterly report on SOB by subchapter	98%	100%	99%	99%
10 Has budget process	100%	99%	100%	100%
11 Has bank account	99%	100%	100%	100%
12 Knows entitlement for SOB	100%	100%	100%	100%

Classroom quality index

The classroom quality index has ten items, and the data was gathered during a class observation session in either a Grade 3, Grade 5, or Grade 8 class. The first three items reflect the presence of a prepared teacher with a class, while the remaining seven reflect the presence of essential items for quality education such as textbooks, learning material, and suitable and adequate furniture for teachers and students (Table 26). The data collectors selected a class from the desired grade randomly and observed the whole lesson, during which they noted the presence of—and counted where necessary—the various items on the list.

Table 26: Items in the Classroom Quality Index

1. Teacher has lesson plan	6. Storage cupboard present
2. Teacher presence	7. Wall displays of teaching aids/student work
3. Percent class attendance	8. Student desks in good repair [pct.]
4. Proportion of textbooks	9. Student chairs in good repair [pct.]
5. Teacher furniture	10. Other books and reference material present

Most school types had positive responses to the items on the classroom quality list (Table 27). Good condition of desks and chairs for students; display of student's work or teaching aid; presence of teacher; and presence of a desk and a chair for teacher can be found in more than 90 percent of the all schools. For items 1 and 2 in Table 27 (presence of a storage cupboard and of other books and reference material), the overall score was low. There was a clear distinction between primary and secondary schools, with the latter much less likely to have either of the two items in the classrooms inspected.

Table 27: Classroom Quality Items, by School Type

Quality Index items	Primary school	Primary school + ECE	Lower secondary school	Full secondary school	All schools
1 Other books and reference material present	42%	45%	29%	25%	40%
2 Storage cupboard for materials	43%	54%	19%	3%	41%
3 More than 75% have textbooks	74%	79%	60%	51%	72%
4 Teacher has lesson plan	85%	80%	84%	81%	82%
5 More than 75% attendance	78%	86%	87%	78%	83%
6 More than 75% of desks in good condition	89%	91%	89%	97%	91%
7 More than 75% of student chairs in good condition	93%	94%	92%	97%	93%
8 Wall displays of teaching aids or student work	95%	97%	87%	92%	94%
9 Teacher present in classroom	95%	98%	87%	94%	95%
10 There is a desk and chair for the teacher	97%	99%	100%	100%	99%

The presence or absence of textbooks (item 3) differed between school levels, with secondary school classes less likely to have 75 percent or more of the students with a textbook in class for that lesson. Three-quarters or more of the primary classes had 75 percent of their students with textbooks, compared to only half of the full secondary school classes, which is a significant difference.

School location differences could be seen for the first five items of the classroom quality index (Table 28). More than half the urban schools had storage cupboards and extra reference material present in the classroom, compared to only one-third or less of the remote schools. A similar distinction could be seen in attendance: 91 percent of those on the class roll were present in the urban schools compared to 71 percent for remote school (Table 28, item 5). For items 6-10 in the index, the results were broadly similar across urban, rural, and remote classrooms observed by the data collectors.

Table 28: Classroom Quality Items, by School Location

Quality Index items	Urban	Rural	Remote	All schools
1 Other books and reference material present	51%	37%	35%	40%
2 Storage cupboard for materials	53%	39%	29%	41%
3 More than 75% have textbooks	79%	70%	71%	72%
4 Teacher has lesson plan	82%	84%	77%	82%
5 More than 75% attendance	91%	83%	71%	83%
6 More than 75% of desks in good condition	94%	90%	91%	91%
7 More than 75% of student chairs in good condition	97%	92%	94%	93%
8 Wall displays of teaching aids or student work	96%	93%	96%	94%
9 Teacher present in classroom	97%	95%	93%	95%
10 There is a desk and chair for the teacher	99%	99%	97%	99%

Environmental quality index

The environmental quality index has nine items, which refer to both safety and utility. The data collectors were told to walk around the school grounds and note the issues assessed in this index. They included items to do with safety (items 1, 2, 4), amenity (items 3, 5, 6), and utility (items 7, 8, 9) (Table 29).

Table 29: Items in the Environmental Quality Index

1. Grounds secured by fence and gate	6. Toilets in good repair with doors
2. Play area with safe equipment	7. Garden area for teaching purposes
3. Available drinking water for students	8. Area neat, tidy with plants and trees
4. Secure bike parking area	9. Well-defined and tidy assembly area
5. Toilets for both male and female students	

Across all school types, schools were least likely to have safe drinking water available on the school grounds and a garden area for teaching associated with life skills (Table 30). They were most likely to have toilets for both boys and girls and for the toilets to be in good shape with doors. Across all the environmental items, standalone primary schools were less likely to have the designated items than primary schools that included an ECE. The same pattern was observed with lower secondary schools and full secondary schools. Without further analysis, it seems likely that size may play a role in this pattern.

Table 30: Environmental Quality Items, by School Type

Quality Index items	Primary school	Primary school + ECE	Lower secondary school	Full secondary school	All schools
1 Safe drinking water in grounds	34%	47%	13%	32%	37%
2 There is a garden area for teaching purposes	24%	39%	44%	60%	37%
3 Safe play area	37%	61%	40%	81%	52%
4 Secure bike parking area	50%	72%	58%	92%	65%
5 Secure grounds fenced with gate	52%	80%	71%	84%	70%
6 There is a well-defined and tidy assembly area	55%	78%	74%	89%	71%
7 The grounds are neat with plants and trees	61%	80%	84%	89%	76%
8 Toilets for both boys and girls	80%	93%	81%	87%	86%
9 Toilets are in good shape with doors	84%	96%	94%	92%	91%

Location has a clear association with all of the environmental quality items (Table 31). In every case, the percentage of urban schools with the desired environmental characteristic is higher than that of rural schools, and in turn, the percentage of rural schools is higher than that of remote schools. Remote schools are doubly disadvantaged in that they are on average smaller as well as relatively isolated. One-quarter or less of the sampled remote schools have safe drinking water and a safe play area. In addition, only one-quarter of them have a garden for teaching purposes, although it seems that this would be fairly easy to set up in a remote school. Nearly twice as many urban schools have a garden, despite being pressed for room in most cases and generally having fully covered compounds.

Table 31: Environmental Quality Items, by School Location

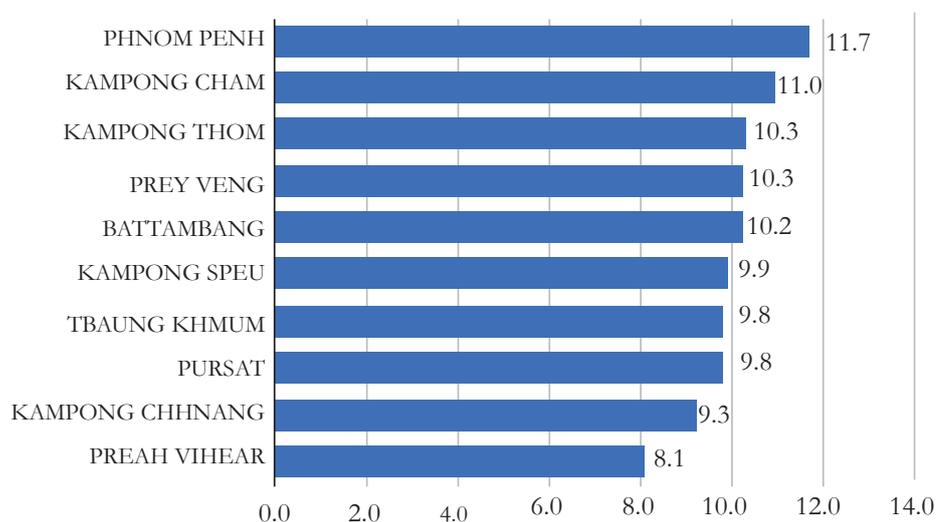
Quality Index items	Urban	Rural	Remote	All schools
1 Safe drinking water in grounds	40%	38%	25%	37%
2 There is a garden area for teaching purposes	46%	37%	26%	37%
3 Safe play area	73%	53%	22%	52%
4 Secure bike parking area	91%	62%	39%	65%
5 Secure grounds fenced with gate	88%	70%	49%	71%
6 There is a well-defined and tidy assembly area	90%	72%	46%	71%
7 The grounds are neat with plants and trees	87%	77%	57%	76%
8 Toilets for both boys and girls	94%	87%	74%	86%
9 Toilets are in good shape with doors	93%	93%	86%	91%

6 Quality aspects

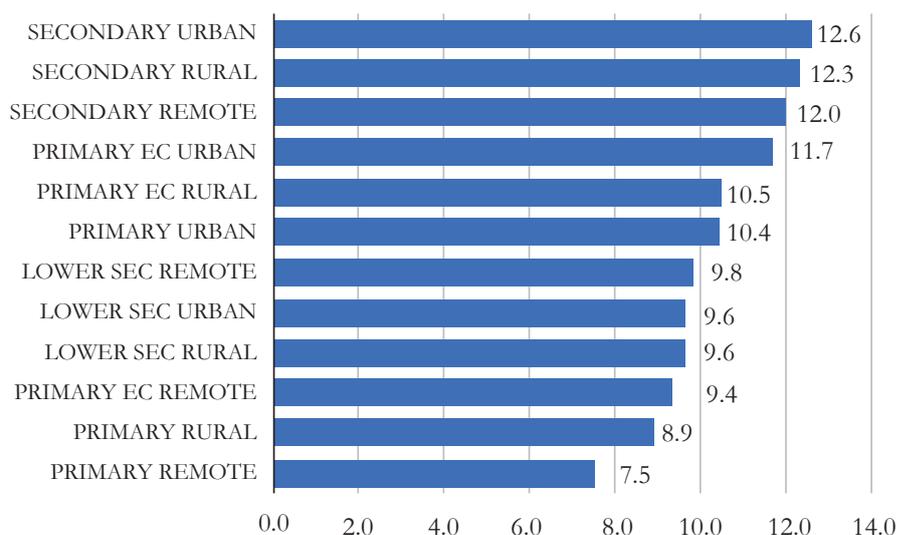
School quality aspects

School quality scores ranged from 2 to 18 out of a possible 19. The lowest score was a rural primary school that was categorized as disadvantaged, while the highest score of 18 was an urban lower secondary school that was not disadvantaged. Phnom Penh and Kampong Cham provinces were clearly ahead of the remaining provinces on this measure (Figure 17), while Preah Vihear, a remote province in northeastern Cambodia, was well behind the other provinces on overall school quality measures.

Figure 17: School Quality Index Scores by Province



Full secondary schools scored best on the school quality index, along with urban primary schools with an ECE. At the other extreme were rural and remote standalone primary schools, which scored less than half on the index (Figure 18).

Figure 18: Average School Quality Index Scores, by School Type and Location

The total amount of operational funding (SOB funds plus SIG funds)¹⁴ was divided into quintiles to assess the consequences for school quality. The one-fifth of schools in the sample that received the lowest amount of operational funds received between USD 248 and USD 1,092. In contrast, schools in the top quintile each received more than USD 3,103, with the top school receiving more than USD 25,000 (Table 32).

Table 32: Quintile Divisions of Total Operational Funds Received by Schools in 2016-17

Quintile 1	\$248 - \$1,092
Quintile 2	\$1,093 - \$1,578
Quintile 3	\$1,579 - \$2,172
Quintile 4	\$2,173 - \$3,102
Quintile 5	\$3,103 - \$25,832

All schools in the lowest operational funds quintiles were primary schools while secondary schools (including lower secondary) are more commonly found in higher quintiles. Nearly half of those receiving the highest level of operational funds (quintile 5) were full secondary schools (Table 33). The composition of each quintile in terms of school type varies considerably. In terms of location, nine out of ten schools in the lowest quintile were remote or rural schools, while less than half of those in the top quintile were in remote or rural areas. Only 6 percent of remote schools were in the top quintile for operational receipts, while 45 percent of urban schools were in this quintile.

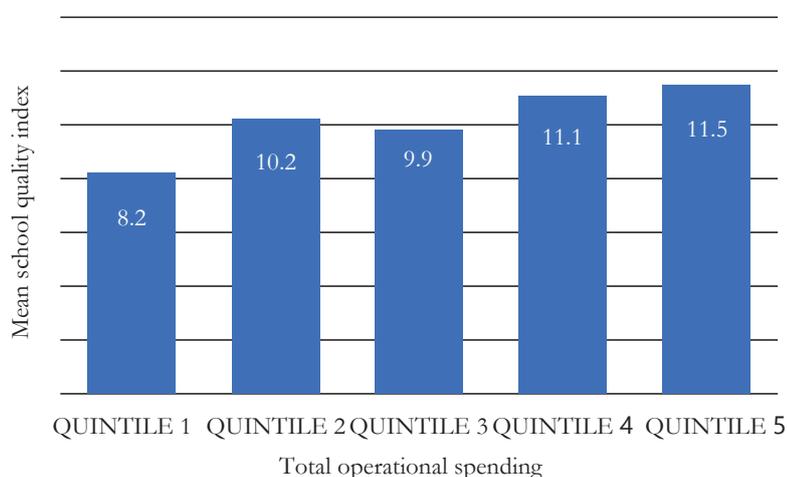
Table 33: Operational Fund Receipt Quintiles, by School Level

14 Total funding was used rather than the per capita amount because it was judged that for many quality aspects, the total funds available were more significant—quality aspects such as school fencing, teacher training, or remedial classes were not dependent on per capita funding. In addition, per capita funding was found to be usually inversely related to the indices. This is because the highest per capita funding goes to small, disadvantaged schools. Even with high per capita funding, due to their size, these schools usually do not have large enough sums to make significant improvements to the school.

School type	Operational fund quintiles					Total
	1	2	3	4	5	
Primary School	55	25	16	18	0	114
Primary School with ECE	22	43	43	39	24	171
Lower Secondary School	0	9	17	18	19	63
Secondary School	0	0	1	2	34	37
All schools	77	77	77	77	77	385

On average, schools that received the most operational funds had the highest school quality index scores. At the same time, those schools that received the least funds had the lowest mean school quality index scores (Figure 19). However, schools in quintile 3, which received USD 1,815 on average, had lower school quality index scores than those in quintile 2, which received USD 1,338 on average. The small disadvantaged primary schools in quintile 1 receive much higher per capita operational funds from both SOB and SIG, but this does not and probably cannot compensate for the limitations imposed on them by their size. Even if they had unlimited funds, the small numbers of children restrict competition and classroom interaction, and the poor situation of their parental homes and staffing difficulties would still work against high-quality outcomes.

Figure 19: School Quality Spending by Operational Spending Quintile

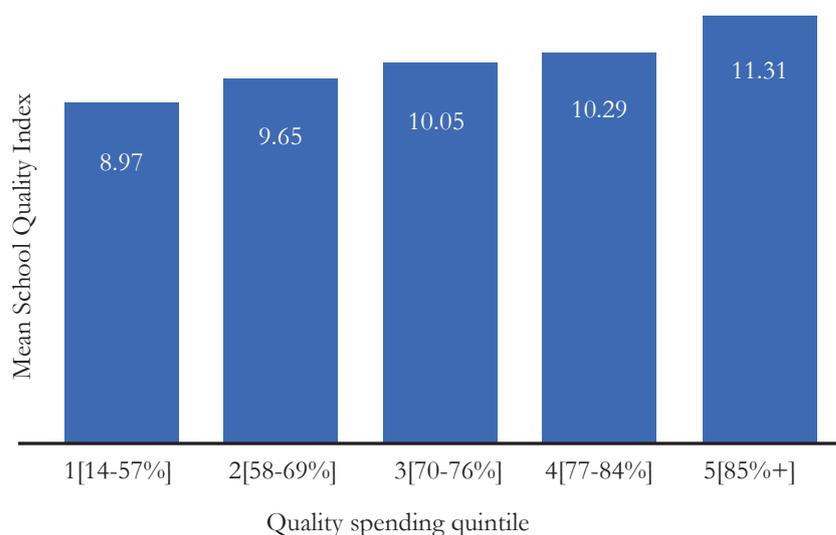


The percentage of SIG funds spent on quality was divided into quintiles to enable a comparison of effects on school quality. The 20 percent of schools that spent the lowest percentage of their SIG funds on quality aspects (quintile 1) spent between 14-57 percent of their SIG funds on quality-related areas. The schools in the highest quintile (quintile 5) spent 85 percent or more on quality aspects (Table 34).

Table 34: Quintile Divisions of SIG Quality Spending Percentages

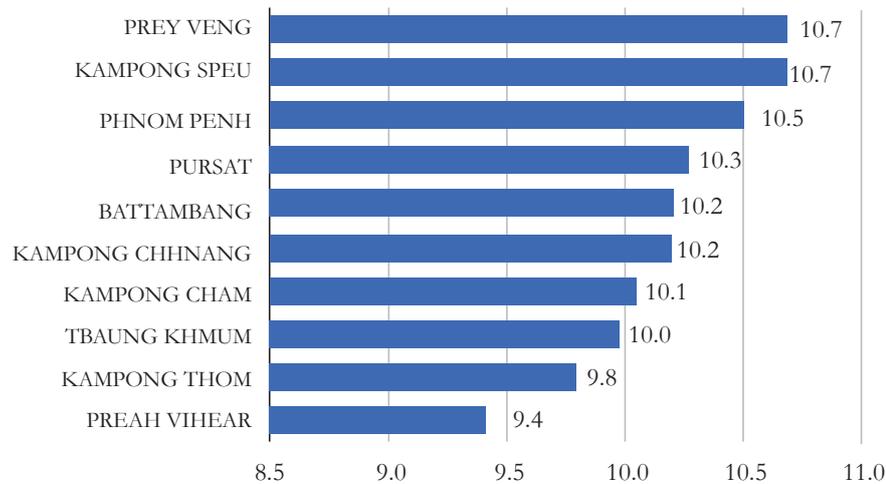
Quintile 1	14 - 57 percent
Quintile 2	58 - 69 percent
Quintile 3	70 - 76 percent
Quintile 4	77 - 84 percent
Quintile 5	85 - 100 percent

Spending more on quality is strongly associated with a higher school quality index score. Schools that spent about half or less of their SIG funds on quality scored less than half of the possible school quality index score. Average school quality index scores rise progressively across each quintile band, and schools that spent the largest proportion of their SIG funds on quality-related areas scored an average 11.3 on the school quality index (Figure 20).

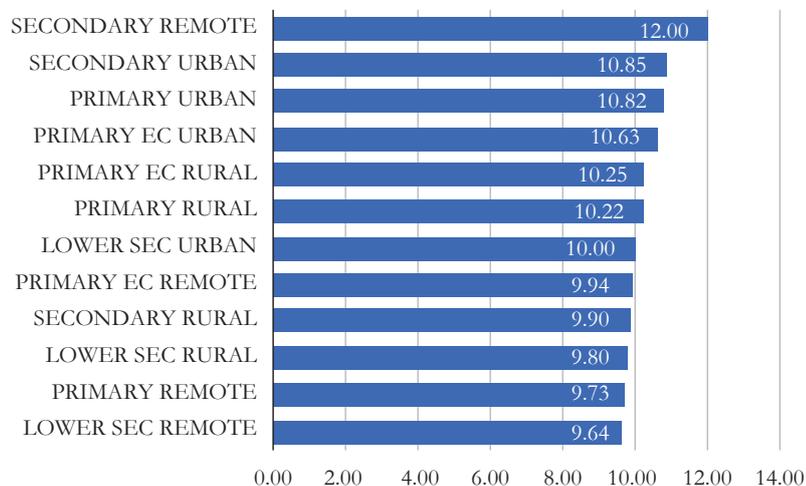
Figure 20: Average School Quality Index, by Quality Spending Quintile

Financial quality aspects

Financial quality scores ranged from 5 to 12 out of a possible 12. More than 20 percent of all schools scored the maximum of 12 points on financial management, showing that a substantial minority of schools could meet all the financial management requirements. Prey Veng and Kampong Speu provinces averaged the highest in financial management, with Preah Vihear again being the lowest-scoring province (Figure 21). All provinces had fairly high average scores on financial management. The lowest-scoring school was an urban lower secondary school that was not disadvantaged.

Figure 21: Average Financial Quality Index Score, by Province

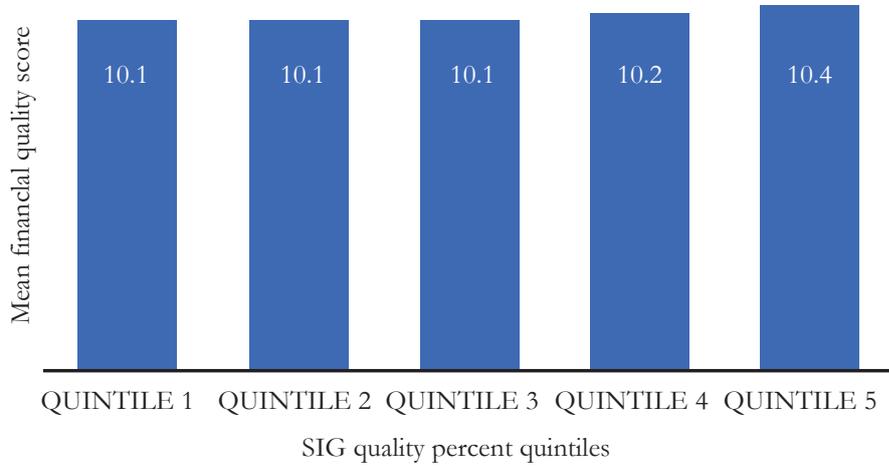
Remote and rural schools saw lower financial management scores, while urban schools were more likely to have higher scores (Figure 22). As this index depends mostly on knowledge of and implementation of standard financial procedures covered in the manuals that every school should possess, the results suggest that either rural schools have had less training or that their school directors and financial officers have less capacity than those in urban areas.

Figure 22: Average Financial Quality Index Score, by School Type and Location

The proportion of SIG spent on quality aspects is weakly related to financial quality scores for primary schools and is not at all related for secondary schools.¹⁵ The mean financial quality scores were similar across SIG quality percent quintiles one to four (Figure 23). Only those schools that spent 85 percent or more of their SIG on quality outputs had a higher mean financial quality score. Province and location in the remote-urban dimension appear to be a stronger determinant of whether a school has good financial management as measured by the financial quality index.

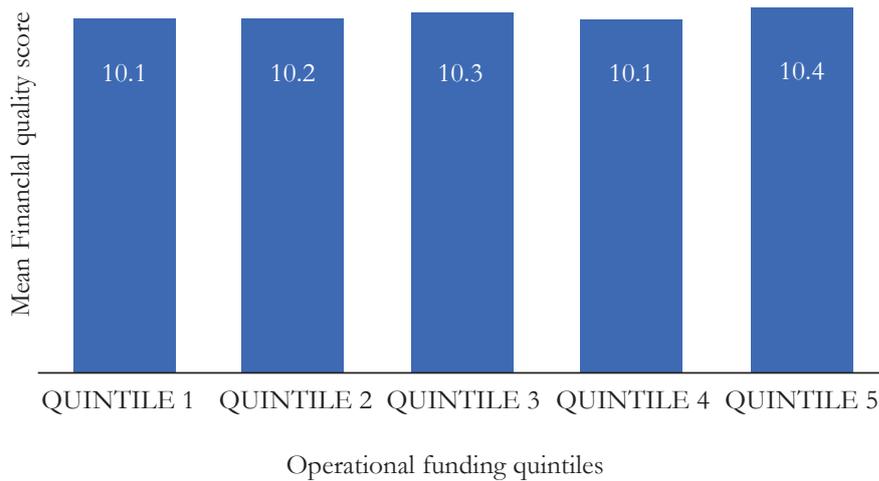
15 For all schools, the Pearson correlation is weak at 0.102 [significance 0.045]. For primary schools it is 0.15 [significance 0.011], and for secondary schools the correlation is 0.095 [significance 0.351].

Figure 23: Mean Financial Quality Score, by SIG Quality Percent Quintiles



The total amount of operational funding does not have a significant association with the financial quality index in the sampled schools. There is very little difference between the average scores of schools that receive the lowest level of SOB and SIG funding and those that receive the highest level (Figure 24). This finding suggests that school practices in financial operations for their operational funds are not related to the size of the funds managed by the school. Even schools with smaller amounts of operational funds to spend and account for can manage the tasks sufficiently.

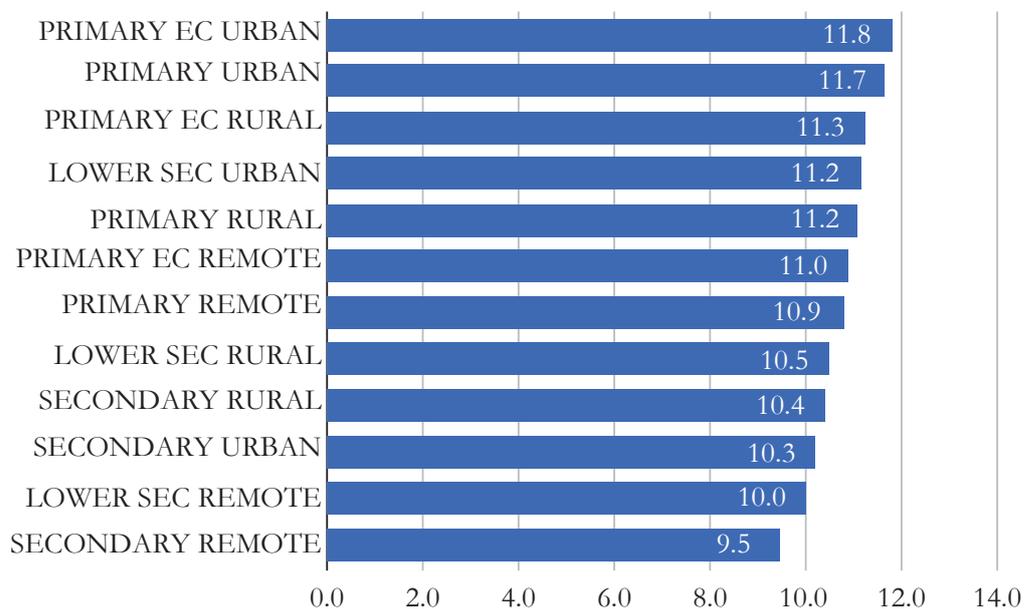
Figure 24: Mean financial quality index by operational funding quintile



Classroom quality aspects

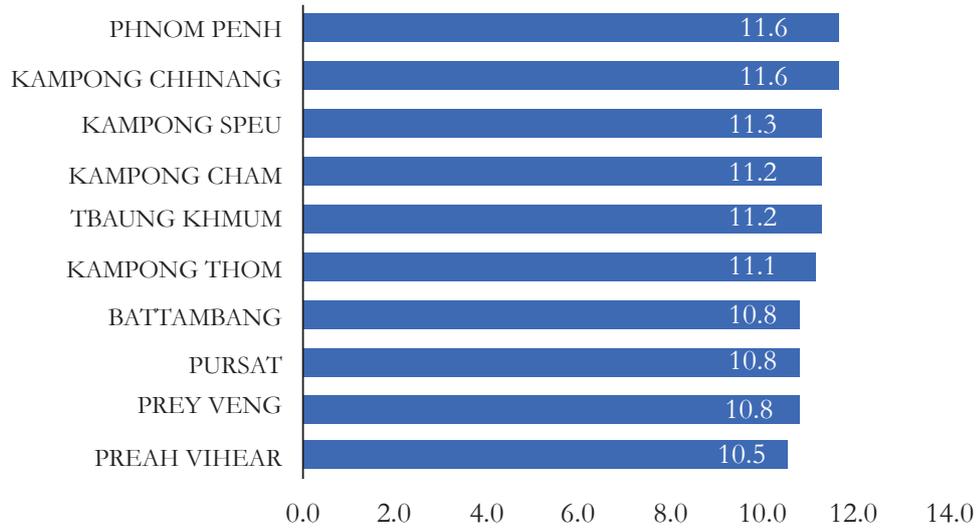
On the classroom quality index, 56 schools achieved the highest possible score of 13. Most of the high-scoring schools were primary schools (16 standalone primary schools and 36 primary schools with ECE). Lower and full secondary schools had relatively low average scores on classroom quality (Figure 25). Most of the components of this index were based on classroom resources related to education quality, and it appears that secondary schools are less likely to have adequate classroom furniture and teaching resources such as textbooks and teaching aids. This is a change in pattern, as secondary schools scored more highly on both the school and financial quality indices.

Figure 25: Mean Classroom Quality Index, by School Type and Location



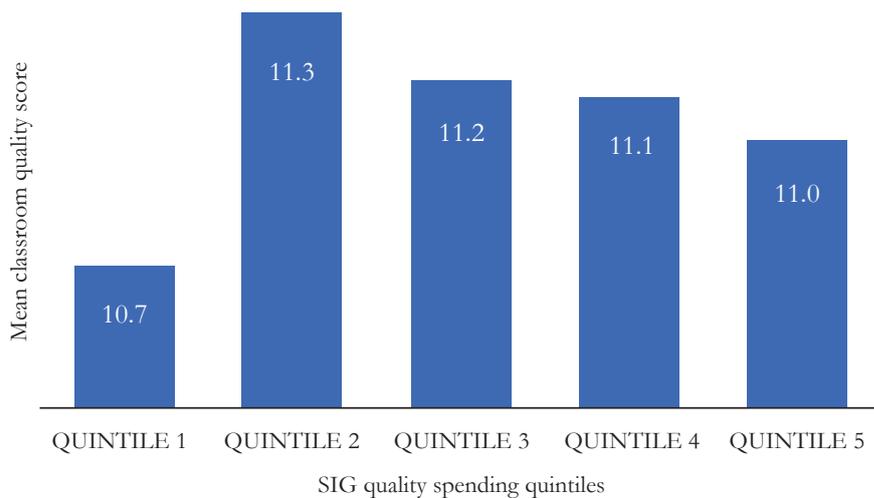
Differences on this measure among the sampled provinces were small, and schools with lower scores were scattered geographically. Phnom Penh had the highest mean score on this classroom measure, along with Kampong Chhnang province (Figure 26). Again, Preah Vihear had the lowest mean score of 10.5. Most provinces had a mean score across their 40 schools of 11 or more out of a possible 13. Poor schools on this measure were scattered rather than located in a few provinces, suggesting that addressing this issue will be a task for POEs and DOEs.

Figure 26: Mean Classroom Quality Index, by Province



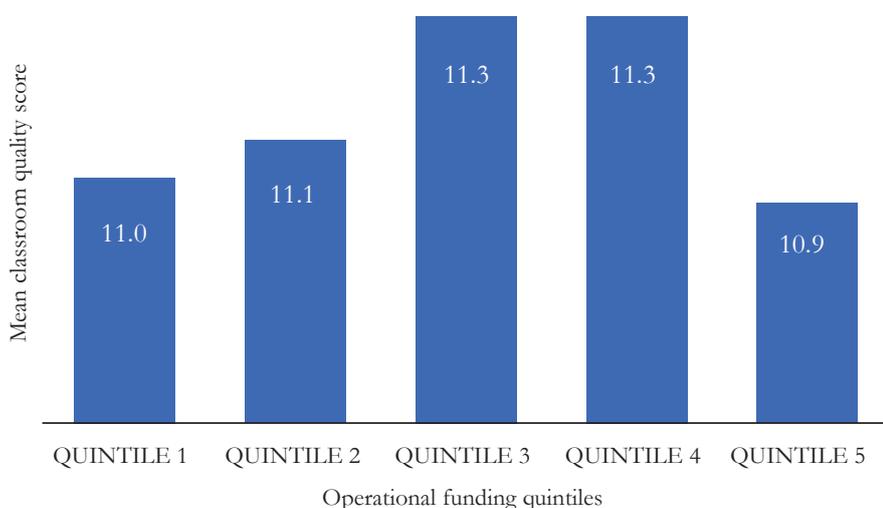
The scores revealed some surprising findings on the relationship between spending on quality and classroom quality. Perhaps unsurprisingly, the 20 percent of schools that spent the lowest proportion of their SIG funds on quality had the lowest mean classroom quality scores. However, quintile 2 had a much higher mean score for classroom quality than might be expected from spending relatively less on quality aspects. Moreover, the relationship between spending on quality and classroom quality then reverses and falls as schools spend a higher proportion of their SIG funds on quality (Figure 27).

Figure 27: Mean Classroom Quality Index Score, by SIG Quality Spending Quintile



Surprisingly, the 20 percent of schools that received the highest average operating funds had the lowest average classroom quality score. Average classroom quality scores were high and rose consistently through the first four quintiles, but then fell for the fifth and highest quintile (Figure 28). Two-thirds of the schools in this quintile were secondary schools, and all received at least USD 3,000 in operating funds from their SOB and SIG transfers. All of the schools in quintile 1, which were the lowest 20 percent of schools in terms of their operating funds from SOB and SIG, were primary schools.

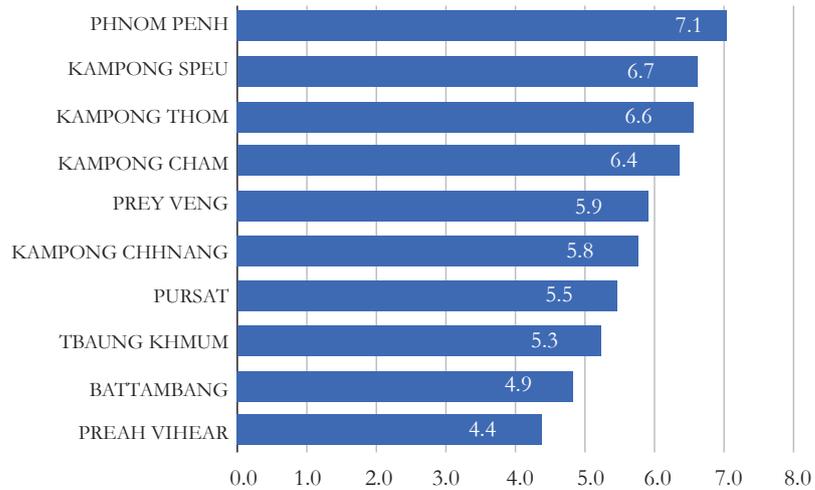
Figure 28: Mean Classroom Quality Index Score, by Operational Funding Quintile



Environmental quality aspects

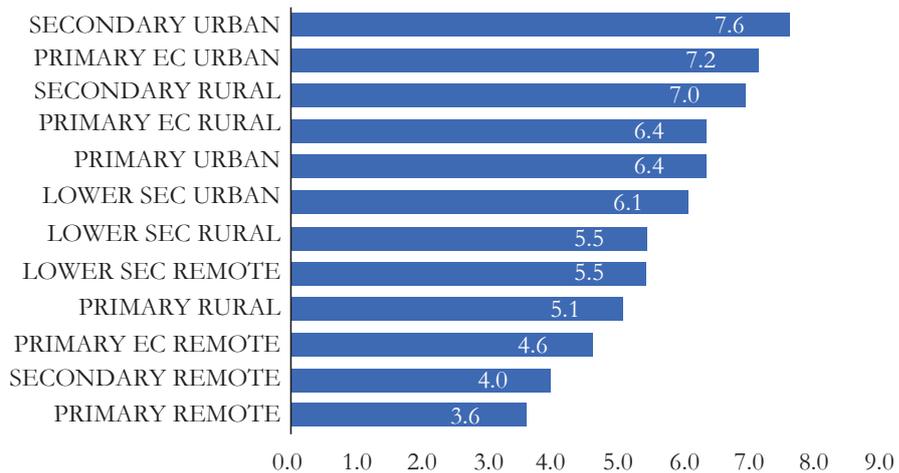
Phnom Penh had the highest mean score and Preah Vihear the lowest, with its 40 schools scoring only half of the possible score for environmental quality on average (Figure 29). The environmental quality index has nine items that are scored equally, so the range of scores is from 0 to 9. The index focuses on the physical environment of the school grounds, which means that the data collectors saw little of quality on the grounds of the schools that scored zero. One in ten schools scored a full nine points, meaning that they were satisfactory on all the items. Ten schools failed to score any points in the assessment of their environmental quality.

Figure 29: Mean Environmental Quality Index Scores, by Province



Remote schools did very poorly on the assessment of the quality of their school environment. Primary and secondary remote schools had the lowest mean scores on this index, with standalone remote primary schools averaging only 3.6 on environmental quality, and remote full secondary schools only 4.0. Full secondary rural and urban schools did much better with average environmental quality scores of 7.0 and 7.6, respectively. Urban and rural primary schools with ECE also scored very well, with average scores of 7.2 and 6.4, respectively (Figure 30).

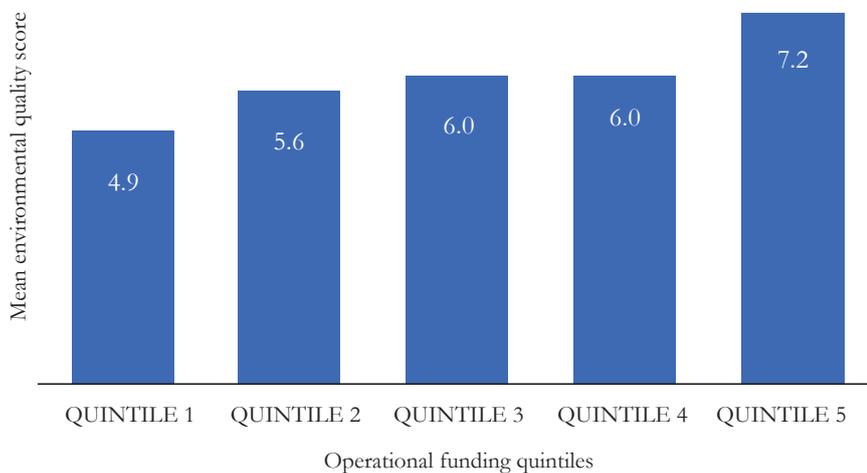
Figure 30: Mean Environmental Quality Index, by School Type and Location



A strong positive relationship was found between the amount received by schools as operational funding (SOB plus SIG) and the environmental quality score. Schools that received the lowest amounts of operational funding had the lowest average scores—these were all primary schools and mainly located in rural and remote areas (Figure 31). Their average score was not much more than half the possible score, indicating a poor state of the playground and associated utilities such as water and toilets. Addressing most of these environmental aspects—fencing the

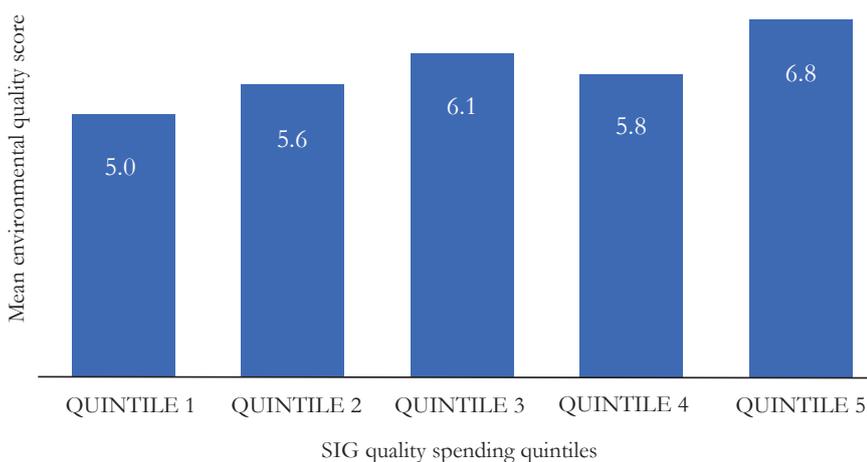
school grounds, providing sufficient safe toilets, establishing a bore for safe water in rural and remote regions—can be costly. It is difficult to see how schools in the lowest quintile will be able to address such issues with their limited operating funds.

Figure 31: Mean Environmental Quality Score by Operational Funding Quintile



Schools that spend the lowest proportion of their SIG funds on quality outputs have the lowest mean environmental quality scores. Although not as strong as the relationship between environmental quality scores and total operational funding (probably because the amounts are much smaller), it is still clearly a positive relationship (Figure 32). Unfortunately, the data collected did not include the individual quality outputs that the schools addressed in their SIG budgeting.

Figure 32: Mean Environmental Score, by SIG Quality Spending Quintile



Summary quality aspects

Most quality aspects of the schools in the sample—and in Cambodia—are linked to school size (Table 35). School size largely determines funding, as a major component of both SOB and SIG disbursements is related to per capita payments. Teachers and classrooms are also linked to student numbers, although not directly. Student numbers are affected by the practice of shifts, in which the school population is divided into two or even three sets who use the same facilities and are mostly taught by the same teachers. Within any one level of schooling, the quality indices are mostly directly related to location, with urban schools of whatever type having higher quality scores than rural, and rural having higher quality scores than remote locations. Again, this is related fairly directly to student numbers, as average school size is influenced by the population densities implied by urban, rural, and remote classifications.

Table 35: Summary Quality, Funding, and School Characteristics, by Level and Location

Level	Location	SOB	SIG quality	Total operational	Characteristics				Indices			
					Schools	Students	Teachers	Class rooms	Schools	Finance	Class rooms	Environment
Secondary	Urban	\$7,157	\$3,383	\$11,044	14	1,827	76	41	12.6	10.8	10.3	7.6
	Rural	\$3,969	\$1,885	\$6,130	21	975	34	20	12.3	9.9	10.4	7.0
	Remote	\$2,743	\$1,642	\$4,662	2	689	26	14	12.0	12.0	9.5	4.0
	All schools	\$5,109	\$2,439	\$7,910	37	1,282	50	28	12.4	10.3	10.3	7.1
Lower Secondary	Urban	\$3,047	\$1,221	\$4,504	11	619	42	15	9.6	10.0	11.2	6.1
	Rural	\$1,886	\$643	\$2,731	41	316	19	7	9.6	9.8	10.5	5.5
	Remote	\$1,461	\$559	\$2,190	11	227	12	5	9.8	9.6	10.0	5.5
	All schools	\$2,015	\$730	\$2,946	63	353	22	8	9.7	9.8	10.6	5.6
Primary+EC	Urban	\$2,092	\$1,098	\$3,433	53	836	27	21	11.7	10.6	11.8	7.2
	Rural	\$1,054	\$503	\$1,776	101	350	9	9	10.5	10.3	11.3	6.4
	Remote	\$936	\$538	\$1,677	19	273	7	7	9.4	9.9	11.0	4.6
	All schools	\$1,362	\$687	\$2,270	173	490	14	12	10.7	10.3	11.4	6.5
Primary	Urban	\$1,009	\$385	\$1,356	12	388	14	11	10.4	10.8	11.7	6.4
	Rural	\$975	\$506	\$1,614	75	235	6	7	8.9	10.2	11.2	5.1
	Remote	\$1,136	\$255	\$994	40	135	4	6	7.5	9.7	10.9	3.6
	All schools	\$1,043	\$357	\$1,278	127	217	6	7	8.6	10.1	11.1	4.8

7 Mathematics and physics achievement

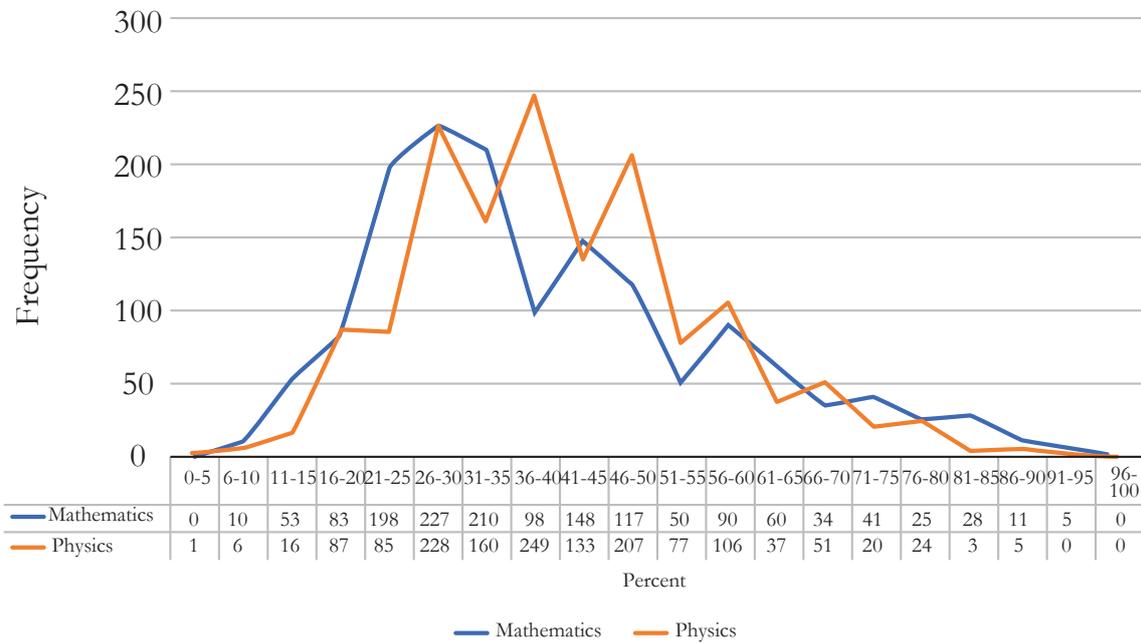
Mathematics and physics tests

MoEYS policy provides for testing of subject achievement and learning outcomes. The Education Quality Assurance Department (EQAD) of MoEYS conducts the national assessment test every year for one grade in a cycle of three years for Grade 3, Grade 6, and Grade 8. The latest national assessment test was conducted in 2016.

The PETS/QSDS team replicated the test in those schools that were not in the 2016 EQAD sample. The selection of students was done in two steps. For the first step, the data collectors had lists of 8th grade students in 2016 for each of the selected schools not tested in 2016. They used this list to select 15 students randomly. For the second step, after obtaining the random sample, the data collectors called the students by name when they arrived at school to do the test. If the sampled students were absent, replacements were made. A total of 1,495 students took the tests—595 in 2016 and 900 in 2017.

Students' achievements in mathematics and physics varied considerably, with weak results overall. On the mathematics test, the scores ranged from 6 to 94 percent with a mean score of 39 percent. For the physics test, the scores ranged from 0 to 87 percent with a mean score of 41 percent (Figure 33). Only 204 (14 percent) of the 1,495 students who took the mathematics test scored 60 percent or more, indicating some mastery of the subject. The results were worse for physics, with only 140 students (9 percent) scoring 60 percent or more.

Figure 33: Math and Physics Test Percentage Distribution

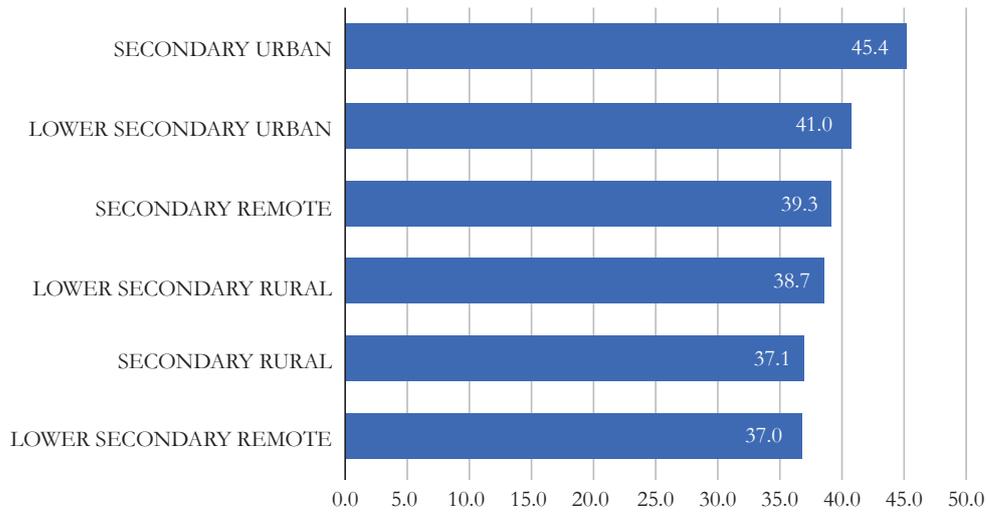


Few schools averaged over 50 percent on either test. Only 11 schools (5 urban and 6 rural) had an average mathematics score of 50 percent or more, and just 8 schools (2 urban and 6 rural) averaged 50 percent or more in physics. Only five schools out of the 100 in the sample averaged 50 percent or more on both tests, and just one of these schools was urban.

Mathematics results

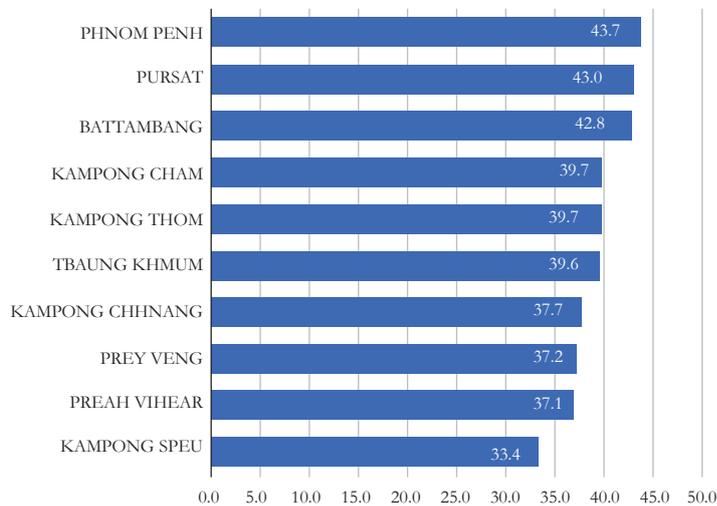
Urban full secondary schools had the strongest performance on the mathematics test, while remote lower secondary schools had the weakest performance. The urban full secondary schools, which had an average score of 45.4 percent (Figure 34), are the largest secondary schools in the sample and reputedly have the best teachers. The remote lower secondary schools and rural full secondary schools had the worst test results at 37.0 percent and 37.1 percent, respectively. Overall, urban schools had better results than rural schools in mathematics.

Figure 34: Mean Mathematics Test Scores, by Type and Location of School

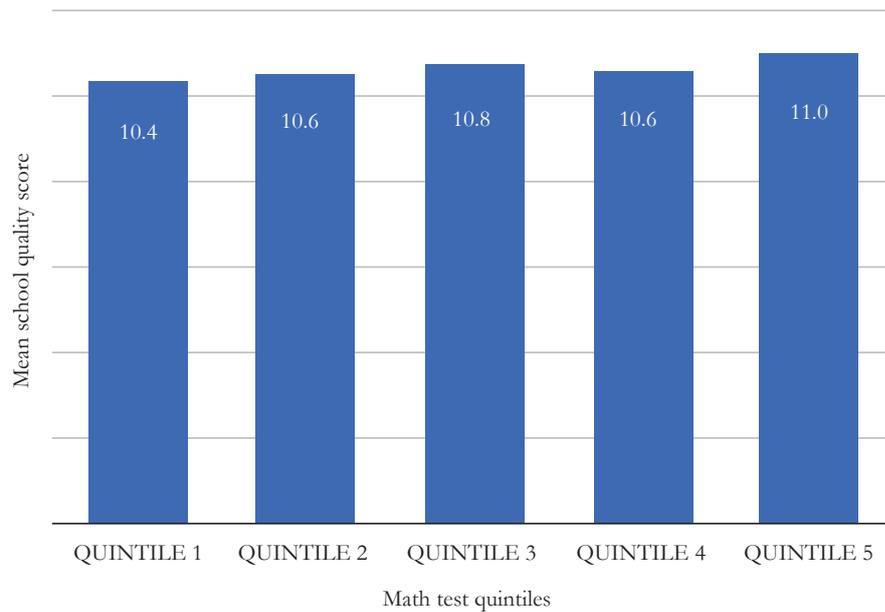


Test scores varied across provinces. Some provinces such as Phnom Penh (average 43.7 percent) and Pursat (average 43.0 percent) had students who did better than the sample average (Figure 35). Even the students from the best provinces did not average 50 percent on the mathematics test. Other provinces such as Kampong Speu, which had the lowest average test score at 33.4 percent, did much worse. Most of the provinces clustered between 37 to 40 percent.

Figure 35: Mean Mathematics Test Scores, by Province



While no strong associations were found, there was a positive association between overall school quality and the mathematics results (Figure 36). The mathematics test results were divided into quintiles, from the lowest 20 percent of results to the highest 20 percent of results. Quality index scores were calculated for each quintile to check the level of association and whether it was significant—i.e. was the quality index predictive of the mathematics or physics results. Average school quality scores were low for students in the bottom 20 percent of mathematics scores and higher for those in the top 20 percent of scores. However, even though the association was positive, it was not strong.

Figure 36: Mean School Quality Score, by Math Test Quintile

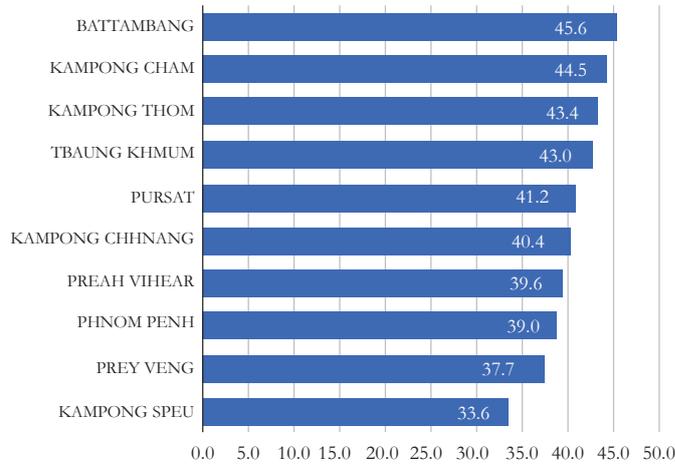
Average classroom quality scores were almost identical across the whole range of quintile results in mathematics. Assessed classroom quality and assessed mathematics ability in the same school appeared to have almost no relationship. The same pattern was found with regard to environmental quality. There was a slight negative relationship between the mathematics quintiles and the environmental scores, but the relationship was small.

No direct link was found between the measures of quality set out here as measures of service delivery and the results in the mathematics test. Province and school size appear to have some connection, but further analysis (perhaps multivariable) can be pursued to test how funding and quality aspects of schools contribute to mathematics achievement.

Physics results

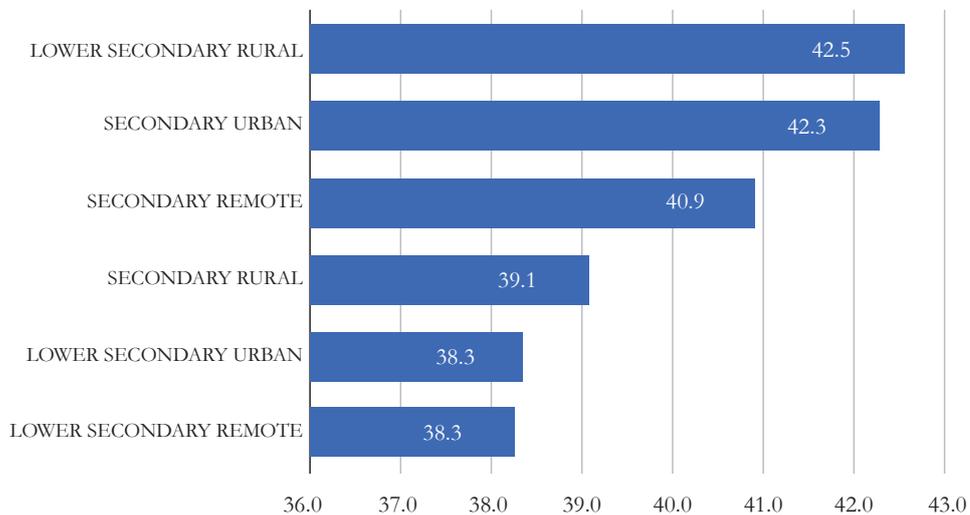
Physics test results also varied among provinces, although apart from Battambang, the highest-achieving provinces were different from those in the mathematics test (Figure 37). Surprisingly, Phnom Penh—which had the best test results in mathematics—was only ahead of Preah Vihear and Kampong Speu, which had the lowest test results for physics.

Figure 37: Mean Physics Test Results, by Province



Location and type of school were quite strongly associated with physics results (Figure 38). Overall, full secondary schools had better results than lower secondary schools, and within these groupings, urban schools had better results than rural, which in turn had better results than remote schools. One strong exception to this pattern was rural lower secondary school students, who had much better results than other lower secondary students and secondary students.

Figure 38: Mean Physics Test Results, by Location



There is little evidence of an association between school quality scores and physics test results (Figure 39). The physics test results were divided into quintiles, from the lowest 20 percent of results to the highest 20 percent of results. Quality index scores were calculated for each quintile to check the level of association and whether it was significant—i.e. was the quality index predictive of the physics results. The lowest 20 percent of test results in physics were in schools where the average school quality result was 10.7, while the highest 20 percent of results were from schools where the school quality index was 10.5. Similarly, apart from the lowest 20 percent of physics scores, no real relationship was found between physics test results and financial quality scores (Figure 40).

Figure 39: Mean School Quality Scores, by Physics Test Quintile

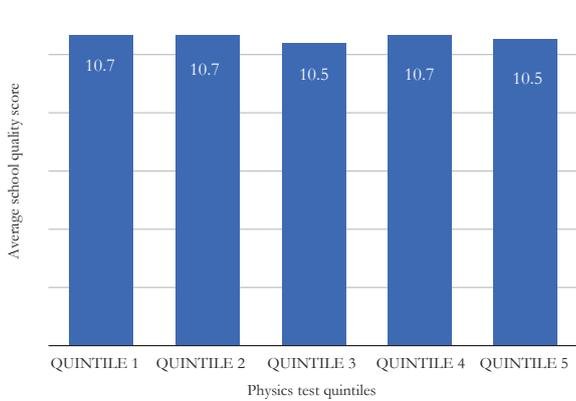
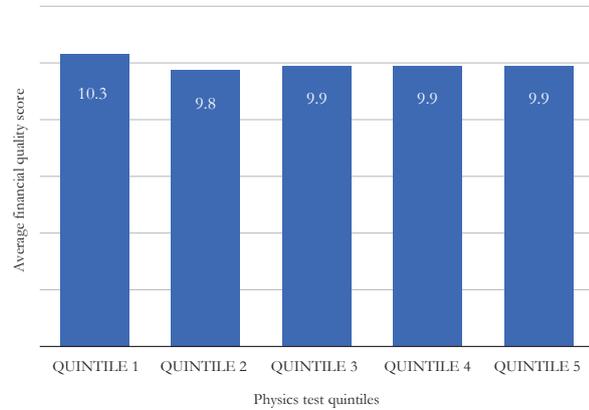


Figure 40: Mean Financial Quality Scores, by Physics Test Quintile



The relationship between classroom quality and physics test results mirrors that for financial quality (compare Figures 40 and 41). The lowest-scoring 20 percent of physics students were in schools that had a higher average classroom quality score than the remaining physics students, whose classroom quality scores all averaged around 10.4. The association between physics results and environmental quality is stronger, but it is a negative association (Figure 42). The average environmental quality score for the lowest-scoring 20 percent of physics students is 6.5, compare to 5.7 for the highest-scoring 20 percent.

Figure 41: Mean Classroom Quality Score, by Physics Test Quintile

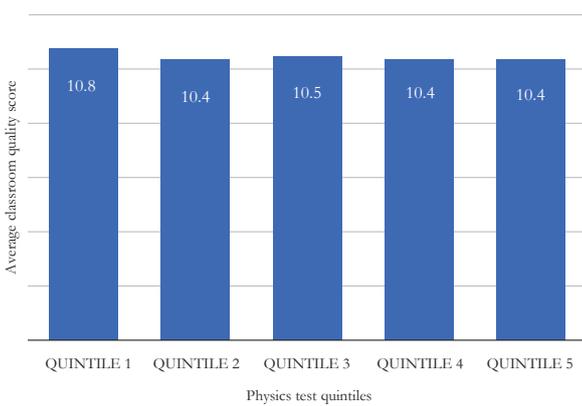
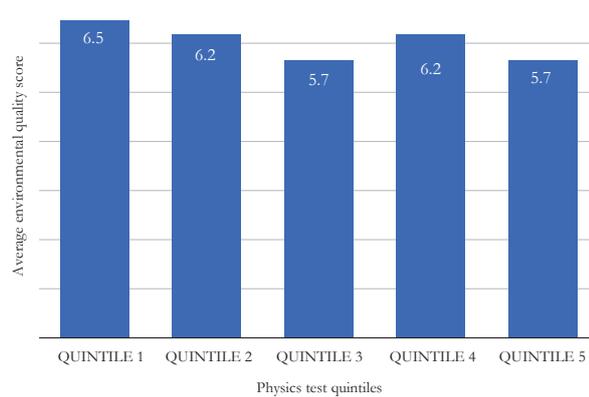


Figure 42: Mean Environmental Quality Score, by Physics Test Quintile



8 Summary of findings and policy implications

Summary of findings on fund flows

Across the 400 sampled schools, the amounts stated to be sent to schools by Treasury or MoEYS were received in full by the schools. The flow of SOB and SIG is generally good from the provincial treasury or MoEYS HQ to POE then to school accounts. POEs received SOB funds in full and generally very soon after requesting the funds. There are generally only days between the initial POE request and the response from the provincial treasury, and the amounts are equivalent—i.e. what is requested is received. On average, fund flows to schools are also complete. Even with the anticipated change to SIF funding, which will see the two amounts combined at the national level to flow through the provincial treasury to school accounts, fund flows are expected to continue to be satisfactory.

Timeliness of funds delivery to schools is a serious problem. Even if funds are received in full, delays in fund availability affect the efficiency of school operations and hence educational quality. Across all provinces, there are clear delays in SOB funding in the first quarter. SIG funds are also delayed but received by schools much earlier in the academic year, usually in January or February, which means that schools can use the funds to bridge the gap before their SOB funds arrive. POEs do not request first quarter SOB payments until April or May, which means SOB payments to schools are not received until well into the academic year. The POEs wait until they are informed by Treasury staff that the funds are in hand for payment. Fund requests are often made late in the third quarter, as well—instead of in June (immediately before the start of the quarter), requests were made in July or August. In addition, several POEs were often more delayed than average in the process of requesting or disbursing funds.

Financial recordkeeping is poor in many schools. Discrepancies were found between what POE recorded as sent and what schools recorded as received, with school records showing an amount lower or higher than what POE recorded as sent. This suggests that recordkeeping at the school level is not sufficiently accurate. By province, schools reported receiving the full amount of SIG funds, but individually, there were similar recording problems as with SOB funds. Some schools under-reported, while others over-reported. The poor recordkeeping may be due to low capacity at the school level (school directors and SSC members) or lack of targeted support by DOEs, or a combination of both.

Summary of findings on service delivery quality

Quality aspects were analyzed relative to total operational funding and to percentage SIG spending on quality using four quality indices developed from questions and observations on several school-based survey forms. These were considered to be key determinants of the school's ability to spend on quality-related areas, as the total amount of operational funding was important in terms of high-cost quality aspects. The percentage of SIG spending on quality was an indication of willingness to consider quality issues as important in school spending. Phnom Penh ranked at the top on three out of four indices, while Preah Vihear ranked last on all four. There were clear differences among provinces in most of the quality indices, suggesting that it would be useful initially to identify and target lower-quality provinces to get rapid gains in quality, rather than to simply address individual schools across all provinces.

Secondary schools, with some variability by location, had higher average school and environmental quality scores and lower average classroom quality scores than primary schools. Urban schools generally scored higher than rural and remote schools on financial quality. Secondary schools and non-urban schools were less likely to provide classroom storage and to have other books and reference materials present in the classroom. This might suggest a difference in values and culture between these different types of schools. Schools were consistent in following financial procedures that made up most of the financial quality index. However, the three measures of community accountability involving distribution of the school budget were consistently low across all school levels and locations. This points to a need for further targeted interventions by the MoEYS Finance Unit to address accountability issues, especially for school directors.

The total amount of operational funds (SOB plus SIG) received by schools related positively to all quality indices except classroom quality. More funds meant better quality. The proportion of SIG spent on quality also related positively to all indices except classroom quality. Plans for SIF expenditure on schools to 2021 as part of the new Sida funding proposal indicate a sharp rise in per school operational funds in this period commencing in 2018, with an almost doubling of school operational funds in SIF over the current combined SOB and SIG funds to

schools. As total operational funds increase, greater amounts could be available for spending on quality-related areas. Therefore, a rise in funding should mean better quality outcomes across all school types and locations.

Poor results on mathematics and physics tests reflect quality of school outcomes. With only 14 percent scored 60 percent or more on mathematics test and 9 percent scored 60 percent or more on physics test, the challenge for quality improvement is huge.

Policy recommendations

Improve the timeliness of fund flows and align procedures for more efficiency in the management of school funds, as SOB and SIG funds flow together as SIF. Currently, the separate provision of SIG funds through a different disbursement process means that they bridge the gap in funding caused by the delay in the first quarter of SOB disbursement. Consideration could be given to providing authorization for expenditure in quarter one to mirror that in quarter four of the previous year, with any rectification made in quarter two to balance the books.

Ease the rigidity of SOB subaccounts to enable schools to execute budget in a way that matches their needs. Rigidity of SOB subaccounts, which was identified in previous PETS, remains an ongoing challenge. Addressing this will require allowing SOB expenditures based on a school's actual needs, without the constraint of line items imposed in the 12 subaccounts of two SOB chapters (60 and 61). Schools can report on actual expenditures, while reporting of expenditures following line items could still be retained by consolidating such expenditures at the provincial level. This can create efficacy in the use of SOB funds and improve development at the school level.

Consider providing SOB payments to small schools in full early in the fiscal year. About 42 percent of schools received SOB funds less than USD 1,000, and in general, these schools rank low on the quality indices. Receiving one-quarter of a small amount four times a year precludes small schools from easily making major expenditures, such as those commonly needed to enhance the school environment.

Address quality of learning outcome. Some measures to improve quality outcomes do not involve extra funding.¹⁶ Providing the intended number of instructional hours can be a powerful improver of outcomes. In Cambodia, the strongest determinant of this is the prevalence of double-shifting in schools, which reduces overall instructional hours. School management measures such as providing the full number of instructional days and the full number of instructional hours may be needed.

16 There may be some costs if this involves ensuring that replacement teachers are available during regular teachers' absences, and the provision of such replacements is much more difficult in remote and small schools than in large and urban schools.

Place top priority for school funding on boosting the quality of teaching and learning to improve substantive outcomes in terms of student achievement.

The items could include support for slow learner students from week one of the school year, coaching of less experienced teachers by more experienced teachers in the school or from neighboring schools, teaching and learning materials, and enough drinking water and toilets for boys and girls.

Improve community knowledge and involvement in school budgets and spending.

This could be achieved through (i) improving compliance checks with the required disclosure of budget to the school, committee, local community through public display, and anyone requesting school budget information during provincial and district staff visits to schools and (ii) regularizing disclosure of the budget and actual expenditures as part of opening and closing parental meetings at all schools.

Address widespread poor financial recordkeeping at the school level.

Regular refresher training could be organized on a regional basis, grouping together geographically close provinces to provide enough numbers each year and to make training courses cost-effective. Refresher training can help address skill shortages, especially as attrition removes trained staff and replacements have no training. Soft skills should be included in the regular management training, in addition to hard skills such as accounting and recordkeeping.

9 Annexes

Correlational aspects of the indices and school characteristics

The discussion in Sections 6 and 7 made observations on the relations between the four indices and total school operational funding and SIG quality allocations by the school. However, it did not make quantified conclusions in terms of correlations, nor did it attempt to bring all the observations into one set so readers could compare the relative strength of the associations. One hypothesis that was not tested by this approach was whether what was observed in terms of the relationships between the indices and the funds available to the school was simply a school size effect. In other words, the larger the school, the larger the funds available because a significant proportion of both SOB and SIG funding is per capita based, and this accounts for the observed results.

However, the relationship between funding and size is not direct. Each school receives a lump sum grant (Tables 1 and 2) as well as per capita funding, so as a consequence, small schools have higher actual per capita funding when all the funds are distributed over all the students. In addition, many schools are classified as disadvantaged, which further raises the actual per capita funding of small disadvantaged schools. A third factor that may further reduce the direct relationship between size and funding is the ability of the school community to choose what proportion of their SIG funds is spent on quality aspects of their school plan versus administration or access uses. To test whether the observed relationships were simply a function of the number of students, a correlation matrix was calculated including the four indices, three aspects of funding (amount of SIG funds devoted to quality, total operational funds, and total operational funds per student), and the total number of students in the school. This was done separately for the 300 primary schools (Table A1) and the 100 secondary schools in the study (Table A2). In addition, all of these were correlated with the mean test scores per school for mathematics and physics (Table A3).

Primary correlations

For primary schools, all of the pairs of correlations except that between the Classroom Quality index and the Financial Quality index were significant (Table A1). The great majority (24 out of 27) were highly significant (0.01 or less), which means that the observed relationships were very unlikely to be the result of chance. Most were positive—increases in one measure were paralleled by increases in the other. The exception was the set of correlations involving actual per student funding, which was negatively correlated with all of the other measures. This is also a size effect, as small schools (especially disadvantaged small schools) had larger base amounts relative to their student population. Thus, smaller schools had more per student funds.

Table A1: Primary correlation matrix

School measures		School quality index											
School quality index	Pearson Correlation	1.00	Financial quality index										
	Sig (2-tailed)												
Financial quality index	Pearson Correlation	.316**	1.00	Classroom quality index									
	Sig (2-tailed)	.000											
Classroom quality index	Pearson Correlation	.222**	.065	1.00	Environment quality index								
	Sig (2-tailed)	.000	.271										
Environment quality index	Pearson Correlation	.471**	.237**	.315**	1.00	SIG quality funds							
	Sig (2-tailed)	.000	.000	.000									
SIG quality funds	Pearson Correlation	.299**	.153**	.206**	.298**	1.00	Total operational funds						
	Sig (2-tailed)	.000	.009	.000	.000								
Total operational funds	Pearson Correlation	.324**	.148*	.188**	.304**	-.978**	1.00	TOF per capita					
	Sig (2-tailed)	.000	.013	.002	.000	.000							
TOF per capita	Pearson Correlation	-.367**	-.118*	-.122*	-.294**	-.305**	-.308**	1.00	Total students				
	Sig (2-tailed)	.000	.049	.042	.000	.000	.000						
Total students	Pearson Correlation	.339**	.179**	.176**	.327**	.961**	.972**	-.359**	1.00				
	Sig (2-tailed)	.000	.002	.002	.000	.000	.000	.000					

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

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

Although nearly all the relationships were statistically significant (27 out of 28), the strength of the relationships was mostly moderate. If two items are positively correlated to a significant degree, the score on the second item can be predicted by knowing the first since the relationship is not a chance one. However, the size of the correlation is a measure of *how well* one can predict the second by knowing the first. Correlations of the order of 0.2 to 0.4, which is where most of the correlations lie, indicate fairly weak predictive power and hence fairly small explanatory value. There are three exceptions in the matrix—all show a correlation of 0.95 or above and thus are very strongly related. Total operational funds are strongly correlated (0.978) with the amount of SIG funds allocated to quality aspects, but this is expected as SIG quality funds are part of the total operational funds as defined for the study. Total student numbers are also strongly correlated with both total operational funds and SIG quality allocations. Again, because a significant amount of both these funds is linked to per capita aspects of total SOB and SIG funds, the result is expected. It also

suggests that the current ratio between lump sum funding and per capita funding is not strong enough to overcome the disadvantage of small school size.

Secondary correlations

The pattern of associations between the same variables for the 100 secondary schools is much weaker than for primary schools (Table A2). Out of 28 pairs, 21 of them have a significant relationship, and only 16 of these have a very strong relationship (0.01 or less). This was much less than observed with the primary schools. The classroom practices and resources summarized in the Classroom Quality index are not correlated significantly with any other measure apart from the Financial Quality index, and this relationship is weak with a correlation of 0.209 and a significance of 0.044. This is very different from the pattern observed for primary schools. Much of the content of the classroom index was based on observable resources in the actual classroom visited by the field workers (Tables 26 and 27). Primary classes are largely based in one room through the day with one generalist teacher. It is in the teacher's interest to accumulate resources in that classroom, as it makes his or her workday better and helps the children learn. In contrast, teachers in secondary schools often move from class to class, and the classes from room to room. Thus, accumulating resources in one room is of much less benefit to any individual teacher. The Financial Quality index, which summarizes observed financial practices based on standard operating procedures, also has a much weaker set of correlations with other variables for secondary schools compared to primary schools. The other correlations in the matrix are generally stronger than the corresponding ones for primary schools.

Table A2: Secondary correlation matrix

School measures		School quality index								
School quality index	Pearson Correlation	1.00	Financial quality index							
	Sig (2-tailed)									
Financial quality index	Pearson Correlation	.270**	Classroom quality index							
	Sig (2-tailed)	.007								
Classroom quality index	Pearson Correlation	-.118	Environment quality index							
	Sig (2-tailed)	.253								
Environment quality index	Pearson Correlation	.422**	SIG quality funds							
	Sig (2-tailed)	.000								
SIG quality funds	Pearson Correlation	.445**	Total operational funds							
	Sig (2-tailed)	.000								
Total operational funds	Pearson Correlation	.423**	TOF per capita							
	Sig (2-tailed)	.000								
TOF per capita	Pearson Correlation	.409**	Total students							
	Sig (2-tailed)	.000								
Total students	Pearson Correlation	.484**								
	Sig (2-tailed)	.000								

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

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

Correlations of Mathematics and Physics test results

One measure of quality of service delivery is student achievement on standardized tests. Mathematics and physics scores were available for nearly 1,500 students in the sampled secondary schools. The students took the tests in either Grade 8 in 2016 or Grade 9 in 2017. The mean score by school for each of the tests was correlated with the same set of variables to test the strength of the relationships. It was hypothesized that the indices, the funding, or the school size would predict the test results (Table A3). However, only 3 of the 16 correlations were significant, and none of them were particularly strong.

Table A3: Test results correlation matrix

Exam subject	Correlation	School quality index	Financial quality index	Classroom quality index	Environment quality index	SIG quality funds	Total operational funds	TOF per capita	Total students
Mean maths percent	Pearson Correlation	.180	-.041	-.066	-.062	.191	.228*	-.080	.214*
	Sig (2-tailed)	.074	.689	.521	.542	.057	.022	.432	.032
Mean physics percent	Pearson Correlation	-.001	-.109	-.178	-.269**	-.081	-.057	.077	-.061
	Sig (2-tailed)	.993	.286	.083	.007	.421	.572	.450	.544

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

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

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