

Solomon Islands



EDUCATION MANAGEMENT INFORMATION SYSTEMS

SABER Country Report
2015

Key Policy Areas

1. Enabling Environment

Solomon Islands has successfully established EMIS as the point of reference that collects, processes, and disseminates education data on a regular basis. Between 2004 and 2015, a series of National Education Action Plans set the foundation for EMIS, yet no official policies support its continuity of operations. Absence of policies has resulted in lack of commitment toward devoting resources in developing EMIS as the core Ministry system, which is threatening its long-term sustainability. Moreover, a greater focus is put on allocating school grants than on collecting quality education data.

Status

Latent



2. System Soundness

Solomon Islands uses the PINEAPPLES (Pacific Island Nation Evaluation Analysis Policy and Planning Leveraging Education Statistics) system, which is based on the Microsoft SQL server. Although the system has a complex design, most of its features are not in use. Paper-based census forms are used to collect data from schools every year, which are input manually into EMIS later. EMIS data contain basic demographic information on schools and students as well as human resource and financial data. However, assessment data, payroll, and other relevant education and noneducation databases are not integrated with EMIS. Quality assurance measures are ad hoc and vendor dependent.

Emerging



3. Quality Data

The concepts and definitions of EMIS are clearly documented in a user guide provided by the vendor. These concepts are based on the technical guidelines prescribed by UNESCO. The education statistics are linked with the overall education strategy of ensuring equitable access, improved quality, and efficient management of resources. However, no internal or external audits are performed to validate the quality of data collected from schools. The entire process of data collection and dissemination takes approximately 13 to 16 months, which adds complexities and reduces comparability of information across the education system.

Emerging



4. Utilization for Decision Making

MEHRD is the primary stakeholder that uses EMIS data, but its usage is limited to allocation of school grants. Education Authorities, principals, teachers, and parents do not use EMIS data for planning, school management, and teaching purposes. Although the government publishes the final statistics on the website, lack of user awareness and weak internet access results in underutilization of data by stakeholders.

Latent



Introduction

In 2011, the World Bank Group commenced a multiyear program designed to support countries in systematically examining and strengthening the performance of their education systems. Part of the World Bank's new Education Sector Strategy, this evidence-based initiative, called SABER (Systems Approach for Better Education Results), is building a toolkit of diagnostics for examining education systems and their component policy domains against global standards and best practices and in comparison with the policies and practices of countries around the world. By leveraging this global knowledge, the SABER tools fill a gap in the availability of data and evidence on what matters most to improve the quality of education and achievement of better results.

This report discusses the results of applying the SABER Education Management Information Systems (EMIS) tool in Solomon Islands. The objectives of this report are to examine the system according to key policy areas, identify successes and challenges in the system, and provide recommendations to support the continued advancement of EMIS in Solomon Islands.

Overview of SABER EMIS

Information is a key ingredient in an effective education system. SABER-Education Management Information Systems (EMIS) aims to help countries improve data collection, data and system management, and data use in decision making. SABER-EMIS assesses the effectiveness of a country's EMIS, with the aim of informing policy dialogue and helping countries better manage education inputs and processes to achieve overall efficiency and strong learning outcomes.

A successful EMIS is credible and operational in planning and policy dialogue as well as teaching and learning. It produces and monitors education statistics within an education system and has a multifaceted structure, comprising the technological and institutional arrangements for collecting, processing, and disseminating data (Abdul-Hamid 2014). It is crucial for tracking changes, ensuring data quality and timely reporting of information, and facilitating the utilization of information in decision making.

The SABER-EMIS assessment methodology is built on four key policy areas that are essential to EMIS and must be assessed to understand and ultimately strengthen the system. Each policy area is defined by a set of policy levers (actions that help governments reach the policy area) and indicators (measuring the extent to which the policy levers are achieved) (figure 1).

Figure 1: SABER-EMIS Policy Areas and Levers

Policy Areas	Policy Levers
Enabling Environment	Policy Levers: legal framework, organizational structure and institutionalized processes, human resources, infrastructural capacity, budget, data-driven culture
System Soundness	Policy Levers: data architecture, data coverage, data analytics, dynamic system, serviceability
Quality Data	Policy Levers: methodological soundness, accuracy and reliability, integrity, periodicity and timeliness
Utilization for Decision Making	Policy Levers: openness to EMIS users, operational use, accessibility, effectiveness in disseminating findings

Source: Abdul-Hamid 2014.

A strong enabling environment lays the foundation for an effective EMIS. Enabling environment refers to the laws, policies, structure, resources, and culture surrounding an EMIS that make data collection, management, and access possible. In essence, this policy area is the context in which an EMIS exists. This defined scope of an enabling environment builds on lessons learned from studies of education management systems.

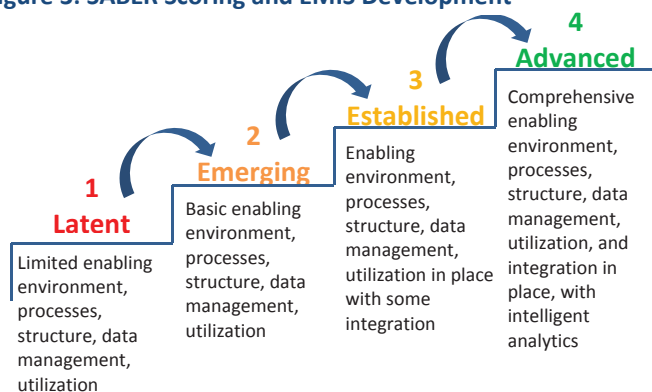
System soundness ensures key processes, structures, and integration capabilities in an effective EMIS. Education data are sourced from different institutions, but all data feed into and make up EMIS. Databases within an EMIS are not viewed as separate databases, but as part of the *whole* EMIS. Key aspects of system soundness include what data are covered in EMIS and how data come together in the overarching system.

Quality data establishes the mechanisms required to collect, save, produce, and utilize information in an accurate, secure, and timely manner. Data quality is a multidimensional concept that encompasses more than just the underlying accuracy of the statistics produced. It means that not only are the data accurate, but that the data address specific needs in a timely fashion. Quality data lays the groundwork for utilization.

An effective EMIS is utilized in decision making by all users (parents, students, teachers, principals, and policy makers) across the education system. An EMIS needs to be used so that measures can be taken to improve educational quality. Accurate information on education sector performance enables the design of more informed policies and programs. To assess utilization, it is imperative to understand where decision making occurs, if the capacity to analyze and interpret education data exists, and if specific data are available to inform decisions.

Using the EMIS data collection instrument, policy levers are scored on a four-level scale (latent, emerging, established, and advanced) to assess the extent to which *both* policy intent and implementation are achieved (figure 3).

Figure 3: SABER Scoring and EMIS Development



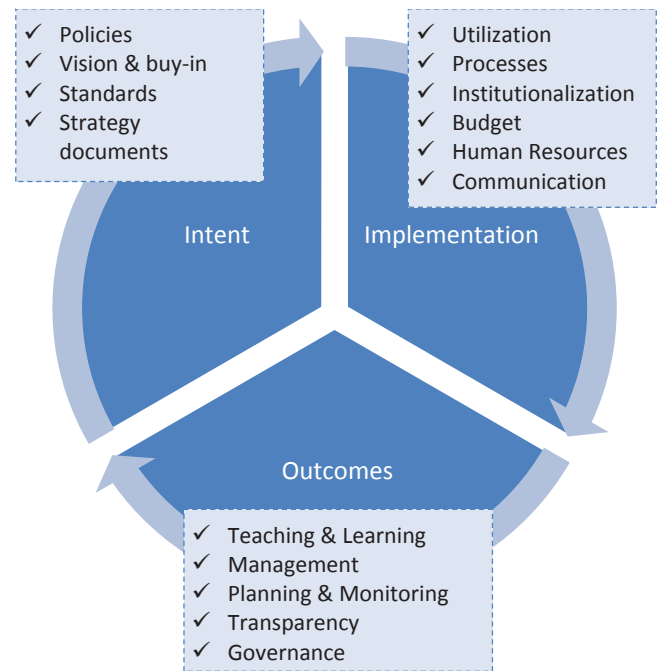
Source: Abdul-Hamid 2014.

Approach

Intent & Implementation

The EMIS assessment examines policy intent and the degree to which intended policies are effectively implemented on the ground (figure 3). Intent refers to the way in which EMIS and its overarching purpose are articulated by decision makers and documented in policies and legislation, as well as standards and strategy documents. Assessing intent alone only reveals part of the picture. As such, this EMIS assessment also evaluates policy execution. Implementation refers to the degree to which policy intentions take place during the day to day activities of stakeholders (policy makers, county administrators, principals, teachers, and students). Implementation can be observed through utilization of

Figure 2: Policy Intent, Implementation and Outcomes Cycle, with Examples



Source: Authors.

EMIS by stakeholders, budget allocation, distribution of human resources, availability of professional development activities, communication and dissemination of information, as well as the extent of institutionalization across the system. Once policy intent and implementation are analyzed, the EMIS assessment explores the results of these two key components, with a focus on system effectiveness and efficiency, in addition to strong outcomes in the areas of teaching and learning, and management and planning. Strong education systems will ultimately use these outcomes to inform the effectiveness of policies and education strategies and make adjustments as necessary, creating the cyclical process illustrated in figure 2.

In Solomon Islands, EMIS intent and implementation were accessed through desk research, analysis of system applications and utilization, as well as interviews with a variety of stakeholders (table 1).

Table 1: Measuring EMIS Intent and Implementation in Solomon Islands

Policy Intent	Implementation
<ul style="list-style-type: none"> • Multiple meetings with MEHRD • Extensive review of relevant central policies • Researched relevant standards and planning documents 	<ul style="list-style-type: none"> • Interviews with stakeholders at central, provincial and school levels • EMIS system application at the central level • Analysis of data quality and comprehensiveness • Thorough utilization assessment

Source: Authors.

Methodology

The EMIS assessment methodology consists of a review of written policies and technical documents as well as interviews with key stakeholders across the education system to ensure proper implementation.

Research and investigation for Solomon Islands EMIS assessment took place between March and April of 2015. The authors conducted a comprehensive review of central policies, as well as technical documents and other background materials. To further examine intent and implementation, a series of interviews and meetings took place with the following entities:

1. MEHRD (EMIS team and other education departments)
2. Sample of EAs
3. Sample of schools
4. Focus group discussions with parents

Country Overview

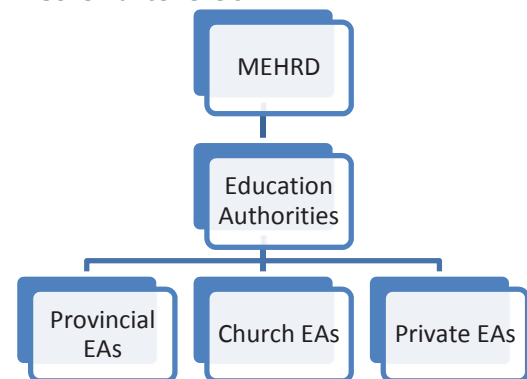
Solomon Islands is an island country located in the South Pacific, consisting of more than 900 islands, more than 300 of which are now inhabited. About 80 percent of the people live in rural areas scattered around the country, making the provision of public services such as education extremely difficult. It has a population of approximately 561,200 people (2013), with 70 percent below the age of 29 years. Being prone to natural disasters, investment in the country is very weak, contributing to a low economic growth rate of 3 percent per annum (2015).

A challenging environment for service delivery including weak infrastructure and institutional capacity constraints

at all levels, including at the teacher level, poses severe challenges to providing quality education. Only 8 percent of the population has access to broadband or internet services, which is very slow, expensive, and unreliable. The majority of schools do not have access to electricity and communications, directly impacting educational services in the country. Although initiatives are being undertaken to provide speedy and affordable internet connections, access to rural areas still poses a significant challenge.

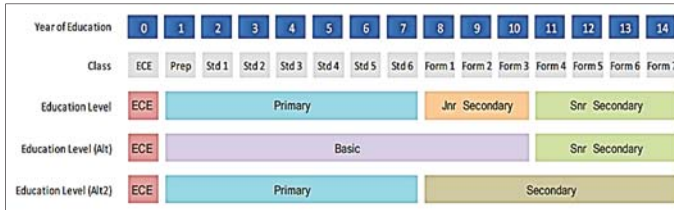
The Education Act (1978) underpins the structure of the education system of Solomon Islands. The education system is organized into three levels of governance: the Ministry of Education and Human Resource Development (MEHRD) at the national level, Education Authorities (EA) at the subnational level, and schools at the local level (figure 4). The EAs are approved by the MEHRD to establish and manage their own schools. The central government provides grants to EAs to manage their schools. Some schools in the capital city are directly managed and supervised by MEHRD, not EAs. Currently, there are 31 EAs (including MEHRD) with at least one EA in each province. EAs can operate in the province they serve or remotely from the capital, Honiara. The country has 1,211 schools, including private, public, and community schools (EMIS 2014).

Figure 4: Governance Levels



Source: Authors.

The education system in Solomon Islands consists of five subsectors: Early Childhood Education (3–5 years), Primary Education (6–11 years), Lower Secondary Education (12–14 years), Upper Secondary Education (15–18 years), Technical Vocational Education and Training (TVET) (15–21 years), and Tertiary Education (18–21 years) (figure 5).

Figure 5: Structure of Education System in Solomon Islands

Source: SIEMIS User Guide.

In 2013, the MEHRD share of spending as a percentage of total government expenditure was 26.2 percent, which is equivalent to 6 percent of GDP (Line Ministry Expenditure Analysis, MEHRD). In addition, the government receives support from many donors, especially Australia and New Zealand. Of the total MEHRD budget (2013), the maximum expenditures are allocated to primary (32.4%), tertiary (31.8%), and secondary (25.6%) education, and early childhood education (ECE) spending is close to 2 percent. The net enrollments rates in primary schools for both males (89.2%) and females (88.5%) was high accompanied with very low enrollment rates for ECE (31%) and secondary schools (37%) (table 2).

Table 2: Education Indicators, at a Glance

Number of schools (2014)			1,211
Number of students (2014)			
Early childhood education			25,161
Primary			125,753
Secondary (lower and upper)			44,104
TVET			3,490
Tertiary			2,179
Net enrollment rates (2013)		Males	Females
Early childhood education			30.5% 30.9%
Primary			89.2 88.5
Secondary			37.1 39.1
Pupil-teacher ratio (2013)			
Early childhood education			16.3
Primary			25.4
Secondary			26
Public expenditure on education (2013)			
As a percentage of GDP			6%
As a percentage of government expenditure			26.2%

Source: MEHRD Performance Assessment report (2006–13).

Solomon Islands EMIS Results

This section presents the main results obtained from the assessment methodology described in the previous sections. Results and scores for each policy area are presented, along with supporting evidence.

Policy Area 1: Enabling Environment

Latent ●○○○

Solomon Islands' system is assessed in the following six policy areas: (1) legal framework, (2) organizational structure and institutionalized processes, (3) human resources, (4) infrastructural capacity, (5) budget, and (6) data-driven culture.

In Solomon Islands, the legal framework for EMIS is largely driven by a series of *National Education Action Plans (NEAPs)* from 2004 to 2015; however, no explicit policies support and define EMIS operations.¹ The NEAP 2013–15 sets a preliminary foundation for the establishment of an EMIS by (1) outlining the responsibility of MEHRD to improve the accuracy of education information and data collection and (2) identifying the Planning, Coordination and Research Unit (PCRU) of MEHRD as the sole agency responsible for managing EMIS. However, the language of the document is very vague and does not clearly outline the need for an EMIS as a single point of reference for data collection, processing, and dissemination. As a next step, a stronger EMIS-specific policy could be established to support the functioning, implementation, and utilization of EMIS.

A greater emphasis is placed on the allocation of education grants than on the collection of quality education data. The *Updated Policy Statement and Guidelines for Grants to Schools in Solomon Islands 2012*

¹ The terms “policy framework” and “legal framework” are used interchangeably. However, not all policies are approved or carry legal status.

(SIGP 2012) drives the data collection process in the country. It plays a key role in EMIS by linking the reporting of data by schools to the allocation of education grants. Although this acts as an incentive for schools to supply information, it also creates adverse incentives for them to report inflated numbers to receive increased funding. Thus, having a grants policy, by itself, is not a sufficient means to collect quality data. Countries need to put in place adequate EMIS-specific policies that focus on developing mechanisms to collect quality data to assess the performance of the education system. Sound validation mechanisms at the school and provincial levels are also essential to monitor quality and timeliness of information provided to schools.

NEAP (2013–15) and SIGP (2012) emphasize data-driven education decision making, but only at the central level.

Both policies underscore the importance of data as a means to assess education sector performance, allocate grants, and manage schools. However, the focus on utilization of data is only at the central level, without taking into account EAs, schools, and other stakeholders. Involving EAs by providing them access to data would ensure better utilization of information at the provincial level, because they would be better equipped to make school development decisions.

The Statistics Act (1970) guarantees confidentiality of information collected from the school census forms.

The law states that “information provided through the census is protected” and “may not be disclosed to any unauthorized persons, or used for nondisclosed purposes.” Although such a law exists in principle, people in the Ministry are not familiar with its clauses, and it is not put into practice. Moreover, the law is ambiguous and does not clearly outline the code of conduct on data security. A good practice could be to dedicate resources toward developing data privacy, confidentiality, and security materials and establishing channels to share awareness on the confidentiality of data collected by the government. This would help MEHRD gain the confidence of parents and communities because they would be more responsive to sharing data on a large scale (figure 6).²

² This example has been adapted from the [U.S. Department of Education: Protecting Student Privacy](#).

Figure 6: Examples of Documents on Data Privacy and Confidentiality

A “**Privacy Toolkit**” includes a list of FAQs; a library of commonly cited resources related to data privacy, confidentiality, and security; and checklists of important items to include in data security plans.

Meetings with Education Authorities annually to offer in-depth reviews of data policies and practices relating to privacy, confidentiality, and data security.

Developing training materials that allow for effective data exchange while still protecting privacy, securing data from unauthorized access, and ensuring the proper governance protocols are in place.

Creating a **help desk** at MEHRD for education stakeholders to submit questions to the department on privacy, confidentiality, and data security issues. The process for submitting questions involves calling a toll-free number or emailing or mailing a question.

No standalone budget is dedicated toward EMIS operations in the country.

Currently, EMIS in Solomon Islands is completely funded by Australia and New Zealand, which have been significantly involved in funding EMIS systems in other Pacific countries such as Kiribati and Vanuatu. Since the core areas of EMIS (such as hardware and software) are funded by donors, no efforts are made by the government to allocate money to its operations. The only money that the government spends on EMIS is directed toward publishing and printing the Performance Assessment Reports (PARs). Any small investments into the system such as software upgrades and related staff training are donor dependent, making the system highly unsustainable. Having a separate budget allocated to the EMIS unit would be very helpful in ensuring the sustainability of the system. Funds received from donors should be channeled through the government systems and documented in the EMIS budget. In addition, regular investments should be made into system quality reviews and training of staff to improve the local capacity and institutionalize the system (figure 7).

Figure 7: Components of the EMIS Budget

Source: Authors.

EMIS human resources consists of a relatively small unit qualified in project management but lacking the technical skills needed for operating the system. The EMIS team resides under the PCRU and consists of three members including an EMIS manager. The staff is responsible for manually entering the information collected from the school census forms into the EMIS system, validating the data through built-in statistical tools, and publishing reports for dissemination. Increasing the size of the team to include more technical experts specializing in database management, communications, and quality assurance would improve quality of outputs.

Professional development is another critical area that requires significant investment by the government. Being heavily dependent on donors, the government does not invest in professional development activities for staff such as training and specialized courses to strengthen technical skills. Uniquet, the vendor that set up EMIS, provided training materials to staff for their use, but this was very limited. Although international organizations such as UNESCO and SPC have provided some training to staff, this has also been on an ad hoc basis.

A database management system exists only at the central level, not at the regional or local levels. Also, the tools for data collection and dissemination are weak. The primary means of data collection is the annual school census, a paper-based document that schools complete and return to the Ministry via postal or shipping services. Involvement of the EAs is limited to delivery of forms

from schools to MEHRD and vice versa, though even this minimal role varies by EA. Because of limited resources and lack of infrastructure to set up internet connections (especially in remote areas), mechanisms are limited through which schools could report back the data electronically. Although some schools (in Honiara) have computer stations through which they send the forms online to the government, this is not a common practice among schools.

Solomon Islands has a weak culture of evidence-based decision making. Although NEAP highlights the use of data to inform decision making, the value of data is not fully understood by education stakeholders. Government needs to initiate efforts to promote the collection and utilization of data within and beyond the education system. This ensures a sense of accountability on each stakeholder, which makes the entire system more efficient (box 1): *“There needs to be massive awareness of why education data is important, especially in the rural areas. Education and information needs to be embedded into the culture of the country”* (parent in discussion with the author, March 2015).

Box 1: Example of EMIS-Specific Policies

Many Latin American countries such as Argentina and Chile have policies that mandate the use and dissemination of education data, drive effectiveness, and safeguard the system in a variety of ways. Policies that mandate EMIS and EMIS resources establish continuity and sustainability for the system. Further, policies that specify responsibilities and roles for data collection and management prevent interference from external agencies. Similarly, policies that guide processes and procedures for working with other units and other sources of data contribute to improvements in quality, efficiency, and integration. Policies can also help to establish the supply of data into EMIS by requiring schools to submit data in a timely manner and positioning the EMIS team as the primary data collection authority.

Source: Abdul-Hamid 2014.

Policy Area 2: System Soundness

Emerging ●●○○

A sound information system is assessed in five areas: (1) data architecture, (2) data coverage, (3) data analytics, (4) dynamic system, and (5) serviceability.

A basic infrastructure supports Solomon Islands' EMIS, but no blueprint guides its structure. Since 2004, MEHRD has used Pacific Island Nation Evaluation Analysis Policy and Planning Leveraging Education Statistics (PINEAPPLES) software as the main database that captures information collected from all schools. It is based on the Microsoft SQL server, which is compatible with Microsoft applications, using Microsoft Excel to conduct statistical analysis and Microsoft Word to create and publish documents. The system is built by an Australian company called Uniquet, funded entirely by donors from Australia and New Zealand.

The system is capable of archiving data (source data, metadata, and final statistics) dating back almost nine years. The major problems are the difficulty of upgrading the software and fixing regular bugs, making the system complicated. Because of lack of investment by the government and lack of commitment by the vendor, the system is not reviewed continuously for software upgrades. EMIS data are made available to public via the MEHRD website (mehrd.gov.sb). The website publishes some key education statistics, policy documents, and PAR, information for which is derived from EMIS and assessment data.

Since its inception, no well-defined blueprint or wire frame has supported the construction of an EMIS. A user guide provided by the vendor accompanies the system, but it is a very complex 800-page report, which is not used or read by the EMIS team. A table of specifications also exists that documents education data definitions, data formats, and layouts, which is also not used in practice, as confirmed by the MEHRD staff. No established audit mechanisms are in place that ensure regular auditing and confidentiality of data. Although EMIS promises to be a comprehensive system in terms of its design structure, many features of the system are not used by the team because of lack of training provided to the staff.

EMIS data include only basic administrative information of schools and teachers; assessment, health, and financial data are not integrated into EMIS, making it difficult to assess the effectiveness of the education system. Each year, MEHRD sends out a 20-page annual school survey form to the schools (public, private, and church) to be filled out and sent back to the Ministry by the end of March. EAs support the process by distributing and collecting the completed forms from schools and sending them back to MEHRD.

EMIS contains school-level statistical information on student enrollments, transitions, repetitions, dropouts, and transfers to other schools. This information is disaggregated by age, gender, and class level. EMIS captures school performance and efficacy data such as student-to-teacher ratios, student-to-classroom ratios, and student-to-school ratios.

The system also contains information on availability of resources in schools such as library resources (instructional videos, reference books, computers, printers, and video players), student textbooks, furniture (desks, chair, and benches), classrooms (number, room size, years of construction, and materials), and general facilities (toilets, electricity, water, internet, and medical supplies). It is important to note that a "head count" approach is used to collect student information; individual level data are not collected by the ministry. Education data collected at the student level can help answer more detailed policy questions, which can inform better decision making (box 2).

Besides administrative data, EMIS captures the breakdown of funding received per school. All schools are required to report all sources from which they receive funding: for example, if the schools receive funding via donations and grants. In addition, schools report if students are required to pay school fees. Although schools are required to report these data accurately, no mechanism validates the data and tracks how the allocated money is spent by these schools.

EMIS also contains basic human resources data on teachers' personal information, such as name, age, gender, marital status, number of children, citizenship, and home province. In addition, it also captures data on their employment status, duties, qualifications, and experience.

Box 2: Example of Data Collected by EMIS in Fiji

Besides school-level data, EMIS in Fiji (also known as FEMIS) captures *individual student data* entered at the school level, which contains information such as student ID number, registered birth number, parent details, gender, ethnicity, date of birth, home situation (e.g., household income, electricity, employment), school attendance, record of school fees, and financial assistance accessed. In addition, it captures health records for each student, including information on disabilities. FEMIS is also linked to the national teacher data system and assessment data system. These linkages help in answering a range of questions such as which children with disabilities, in which settings, under what circumstances, are achieving what educational outcomes? Or, which teachers with what type of training are creating environments that result in good learning outcomes for children with disabilities?

Source: Sprunt 2014.

The system is capable of performing basic tabulations; however, increased focus on predictive modeling and scenario analysis can push the system to a more established level. The Analysis Workbooks are the main data analysis and reporting tools contained in SIEMIS (SIEMIS User Guide). These workbooks are built on Microsoft Excel and linked to the data contained in EMIS. Analysis is conducted using pivot tables and pivot charts, which draw data from the system to conduct descriptive analysis, data tabulations, and data relationships, as needed by the users. Data can be easily aggregated and disaggregated by age, gender, schools, and districts. It is also possible to calculate ratios (e.g., teacher-student ratios), rates (e.g., transition rates, enrollment rates, etc.), and relationship between variables (e.g., gender and enrollment). Although this information can be produced in real time, outputs from this analysis are used by the staff only to produce the PAR, published once every two years. Besides this, no other advanced statistical tools are used to perform projections and estimations of statistics (e.g., projecting enrollment rates for the next five years). Staff are not equipped with any

other advanced statistical software such as STATA or SPSS to conduct high-level analysis.

Few discussions are held between the central government, education authorities, and schools to review the existing portfolio of data and identify new data needs. Parents, teachers, and schools are never consulted or interviewed to understand their data needs. EMIS is seen as a “top-up” initiative, with the government reporting data to donors and other international organizations, not to the education authorities and schools. Further, the same census forms have been distributed for more than 10 years without any consideration of capturing additional data.

Serious issues are seen with regard to compilation of data, data validity across different sources, and integration of education and noneducation databases into EMIS. The process of compiling data into EMIS is very lengthy and may involve duplication of information and errors. Only two EMIS staff are in the unit who are responsible for compiling the annual school survey forms and inputting data into the system. Since the data are entered manually, no other mechanism is available to reduce or identify any coding, editing, or tabulation errors. Entering data into the system can take many months, which increases the time lag between data collection, production, and dissemination.

EMIS stores time series data dating back to 2006. This enables the EMIS team to verify data consistency over time and check for any deviation in trends. This becomes especially important because schools have adverse incentives to report inflated enrollment numbers to get increased funding. The system has also archived all data collected since its inception, including source data as well as final statistics.

EMIS is a standalone system, not integrated with any other information systems, within or outside the education system. Within MEHRD, different departments have different databases capturing education information such as (a) learning assessment data (ATLAS information system), (b) teacher payroll data (SIEMIS), and (c) scholarships data (SIMS), but none are integrated with EMIS. Other education divisions within MEHRD maintain some education data, also not integrated into EMIS. These include (a) school inspection data, (b) school grants data, (c) a register of teachers, (d)

teacher training and professional development, and (e) a register of education authorities. Moreover, relevant noneducation external databases such as workforce data, internship information, and the like are not collected or linked with the EMIS system. A well-defined integrated EMIS system includes both education and noneducation data from different sources, collected at different levels (student, school, and government levels), over a long period.

A key ingredient for data integration is having multiple common IDs (such as student, teacher, and subject IDs) that could link these different databases. Identifiers could be in the form of name, date of birth, enrollment number, and so on. Data integration could help governments draw and link information from different sources, helping them identify trends and correlation, equipping them with tools that would facilitate stronger and more targeted policy decisions. It would improve the efficiency of the system, serving as a one-stop shop to gather information on education indicators.

A comprehensive EMIS includes not only administrative data but also financial, human resources, and learning data (table 3). This information should be available at both the individual and aggregate level. The type of data entered into the system needs to follow logic and a fixed methodology and have a well-defined purpose (Abdul-Hamid 2014).

Table 3: Data Coverage, Best Practice, and Solomon Islands

Data Type	Best Practice	Solomon Islands
Administrative data	<ul style="list-style-type: none"> • Demographic • Health • Attendance (enrollment, repeat, dropout, progression, etc.) • School level 	<ul style="list-style-type: none"> • Demographic • Enrollments • Repetitions • Dropouts • Transitions
Financial data	<ul style="list-style-type: none"> • Budgets and revenues • Spending • Cash transfers and subsidies • Unit cost per student 	<ul style="list-style-type: none"> • Unit cost per student
Human resources data	<ul style="list-style-type: none"> • General demographics • Salaries • Performance evaluation • Professional development 	<ul style="list-style-type: none"> • General demographics
Learning outcomes data	<ul style="list-style-type: none"> • Classroom assessments • National assessments • International assessments 	

Source: Adapted from Abdul-Hamid 2014.

Policy Area 3: Quality Data

Emerging ●●○○

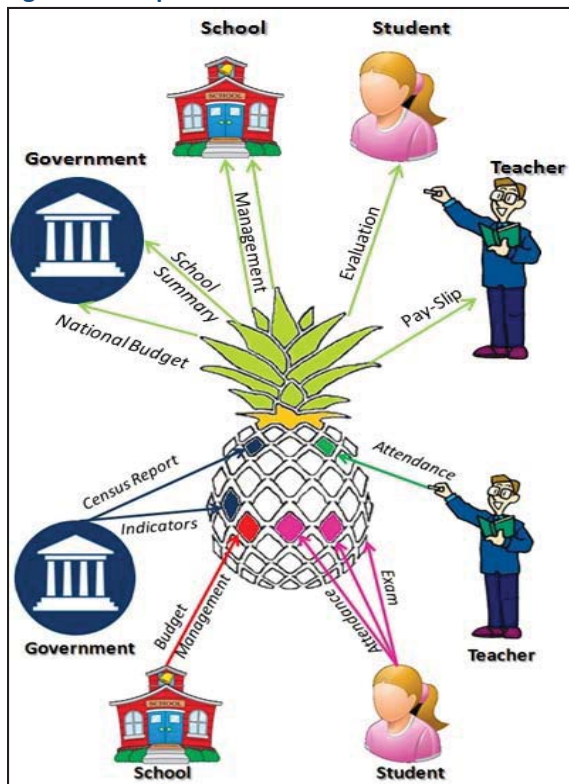
The quality of data collected by Solomon Islands' EMIS is assessed in four policy areas: (1) methodological soundness, (2) accuracy and reliability, (3) integrity, and (4) periodicity and timeliness.

The concepts and definitions of EMIS are well documented in a user manual, following technical guidelines prescribed by UNESCO. Technical documents are provided by the vendor, which contain detailed information on the terminology of the education statistics tracked by the system. Complete information is provided on the structure of the entire database and how information flows from one part of the system to another (figure 8). Although not all databases in EMIS are actively functioning (only administrative data are functioning), the diagram is a useful tool for

understanding how information in these databases translates into analysis and reporting. In addition, comprehensive microdiagrams are provided for each component of the databases to help users understand the functions of the system.

2. To improve the quality of education in Solomon Islands
3. To manage and monitor resources efficiently and effectively.

Figure 8: Components of EMIS



Source: Adapted from SIEMIS User Guide, 2011.

Additionally, these documents provide information on how to map Solomon Islands' education structure to the International Standard Classification of Education (ISCED) education level codes prescribed by UNESCO. Each statistic in SIEMIS can then be calculated for both the regular education levels as well as ISCED levels. This also facilitates easy reporting of statistics to the UNESCO questionnaire, which all countries worldwide are required to submit.

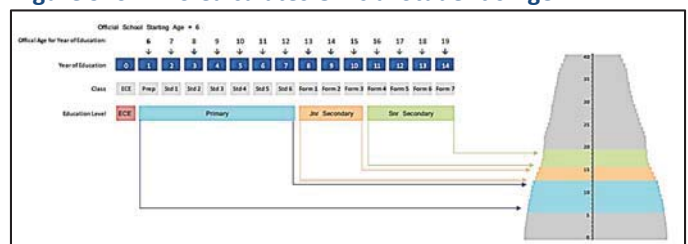
Education data captured by EMIS is linked to the overall education strategy articulated in NEAP (2013–15). Education statistics are linked to the three strategic NEAP goals:

1. To achieve equitable access to education for all people in Solomon Islands

However, the scope of education statistics in EMIS is not broad, but instead is restricted to a small number of indicators such as enrollments, completion rates, and basic demographic indicators. The data collected are not comprehensive, nor do the data track student and school performance longitudinally. Moreover, metadata are not included with education statistics.

With regard to recording of data, the student's age is recorded according to a specific date or reference period. Once the official primary age is entered into SIEMIS by the EMIS staff, the system easily calculates the age group for each education level (figure 9).

Figure 9: SIEMIS Calculates Official Student's Age



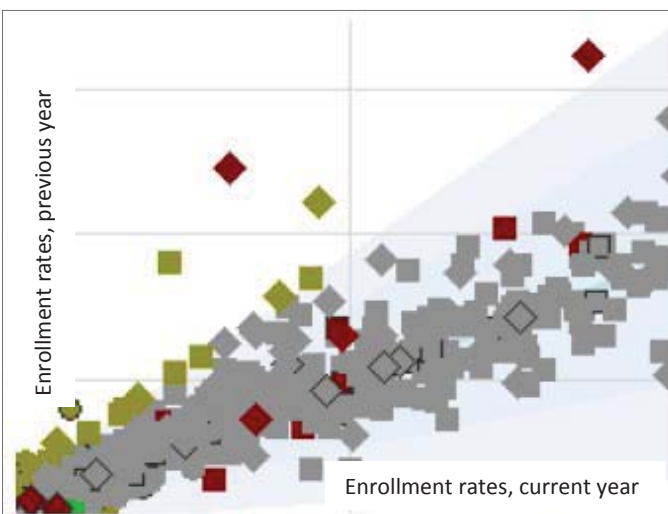
Source: SIEMIS User Guide, 2011.

Source data do not provide an adequate basis for compiling statistics. The administrative school census contains information on the structure of the education cycle, schools, students, and teachers' personal details. It does not gather information on any indicators related to school management or education expenditure. Moreover, the census is not created in a manner that allows for easy completion by school principals. Many of them struggle with completing these forms because of lack of training for collecting the required information. The template is also not compatible with the EMIS system, and the data have to be manually entered by staff into the computer. The school forms are also not received on time from schools, which delays the entire data collection process. Revising the design of the school census forms to add more relevant education statistics as well as a reduction in the manual entry of data into the system would enhance EMIS in Solomon Islands.

No validation mechanisms are in place at the local or central level to monitor the quality of data entered into

the system. However, a statistical tool in EMIS flags suspicious values. The quality of data generated by EMIS is dependent on the quality of information collected from schools. Inadequate and incomplete information can compromise the quality of outputs produced by the system, which in turn can affect the ability of the government to make sound policy decisions. For this reason, having strong validation mechanisms at the school and provincial levels as well as automated tools to flag suspicious data would be of critical importance. To address these issues, EMIS has a built-in tool called “XY Charts” to identify data that may seem suspicious or inaccurate. XY Charts is a tool that is able to spot any data that is an outlier, by comparing current year values with the previous year’s information. As an example, in figure 10, plotting enrollment rates for the previous year against the enrollment rates for the current year will produce a set of ratios that is likely to vary within a limited range, because school sizes are not assumed to vary much over a span of one year. The chart helps identify any significant outliers to the trend observed (bold red dots that lie outside the gray area). Once the EMIS staff notice any suspicious data, they would investigate and cross-verify this information with the schools.

Figure 10: Data Quality Measures: XY Charts



Source: SIEMIS User Guide.

However, the scope of this tool is very limited because it can compare information only against previous trends. Besides this tool, no other validation measures are adopted to verify data collected from schools at any time. A good practice would be to assign central level

officers at the provinces to monitor school-level data collection.

EMIS staff are not bound by any professional code of conduct while performing their duties. No procedures are in place that require staff to follow any professional conduct. No efforts are made to promote research by the team using the data generated from EMIS. Also, the statistical practices are not transparent. No public information is made available regarding how the data were collected or compiled. There is a lack of awareness of the publications and education statistics produced by EMIS.

Huge delays are seen in collecting data and producing statistics from EMIS. The entire process of data collection, processing, and dissemination can take approximately 13 to 16 months. Absence of policies and mandatory procedures results in schools not reporting data on time. Geographical location is also another area of concern. Schools located in rural and suburban areas find it difficult to send their forms on time to MEHRD because of poor shipping and postal services. In addition, manual entry of data into EMIS takes three to four months. As a result, the final annual statistics book (PAR) is published only once every two years. Having education authorities closely monitor schools and assisting them in providing data on time would help reduce the time lag.

Policy Area 4: Utilization for Decision Making

Latent ●○○○

The utilization of Solomon Islands’ EMIS data is assessed in four areas: (1) openness, (2) operational use, (3) accessibility, and (4) effectiveness in disseminating findings.

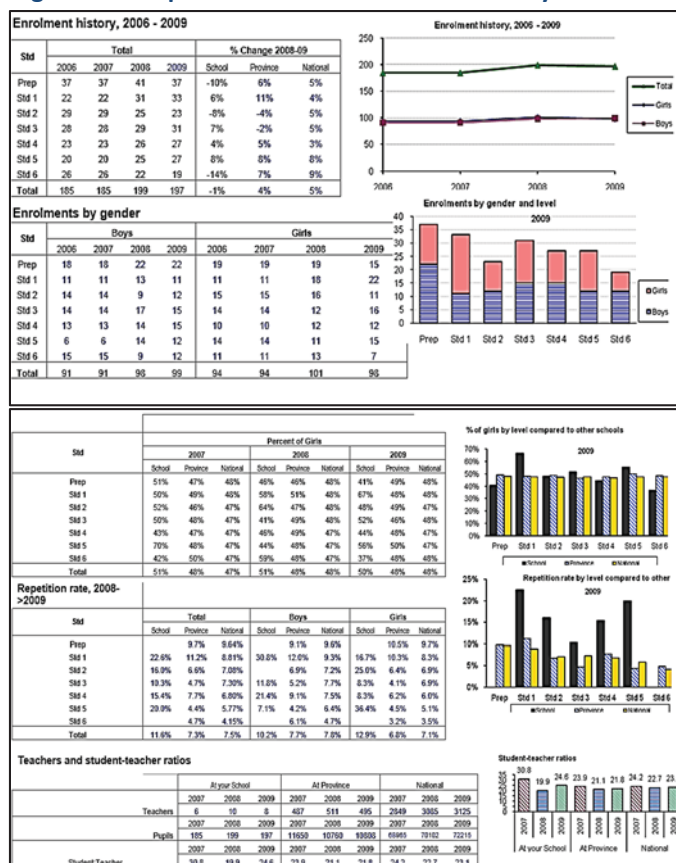
The Performance Assessment Report (PAR) is the annual statistics handbook produced and disseminated by MEHRD. MEHRD uses EMIS data to produce the PAR, which is printed and published on the MEHRD website once every two years. Although this is a useful tool for education stakeholders to assess the education system, it is rarely used in practice. Lack of user awareness of the existence of these reports (due to poor dissemination strategies) coupled with a weak internet makes it inaccessible for most stakeholders.

A two-page school feedback report is sent by MEHRD to all schools, but this is rarely used in practice. At the end of the data completion cycle, schools receive a short feedback report from MEHRD that contains a brief analysis of school performance. It contains descriptive statistics on school demographics such as enrollment history, enrollments by gender, repetition rates by grade and province, and student-teacher ratios (figure 11). This feedback loop helps involve schools in the EMIS process by providing them with performance data, but it is not useful for many reasons. First, there is a lack of data-driven culture in the country. School principals and teachers do not understand the importance of data to inform their decisions on teaching and student learning. Second, timelines are a major issue. The feedback report is sent with long delays (sometimes more than a year), which makes the data redundant and lacking in context. Third, inaccurate reporting of data by schools makes this information unreliable.

Creating awareness of the importance of data and equipping schools to analyze the data reported by them would be a good start to help them understand its usage. Workshops and focus group discussions should be held in schools to train school staff on (a) how to fill census forms, (b) how to use data to make school improvement plans, and (c) training teachers on the use of data in classrooms. MEHRD should also make attempts to reduce the time lag between data collection and dissemination so that schools receive the feedback report on time.

EMIS is open only to the central government (MEHRD) and donor organizations supporting the system. EMIS is a hierarchal initiative established to feed data from schools to MEHRD. Although MEHRD collects data through EMIS, its usage is limited only to the allocation of school grants, not for improving governance and accountability of the education system. International organizations, such as the UNESCO Institute of Statistics, and donors from Australia and New Zealand request data via email, outside of EMIS. However, these organizations' usage of data is limited to basic information on education structure, enrollment figures, and other education demographics. Besides MEHRD and donor organizations, no other education stakeholder is aware of or uses EMIS data in their core operations.

Figure 11: Snapshot of the Feedback Received by Schools



Source: EMIS team. MEHRD.

Local education authorities do not have access to data, and as a result, they cannot use this information to manage their schools and hold them accountable: "We cannot monitor schools because we do not get information collected by the annual forms. Accessibility of data is a major issue" (EA representative in a discussion with author, March 2015). For schools, EMIS represents mandatory filling and reporting of the annual school census form to the Ministry.

Efforts could be made to improve the dissemination of data so that users are more aware and understand the benefits of data. Lessons could be learnt from countries that have adopted strong dissemination materials to create a data-driven culture in the society. Newsletters, publications, report cards, and other documents could be produced that would cater to the needs of various stakeholders such as parents, teachers, principals, and other communities. As an example, Chile has developed a toolkit for data dissemination materials for different audiences that help them in policy making, providing information on student learning as well as holding schools accountable (table 4).

Table 4: Example from Chile on Data Dissemination Strategy

Assessment guidelines	Provide pedagogical support to school principals, pedagogical coordinators, and teachers
School report	Provide pedagogical support to school principals, pedagogical coordinators, and teachers
National report	Inform policy to decision makers and general public on student performance across grades and regions
Newspaper supplement	Hold schools accountable by publishing data on school grades by subject across regions
Parent report	Hold schools accountable and involve parents in school
Online bank item	Provide pedagogical support to teachers through releasing test questions from all subject areas and target grades
Press kit	Inform policy by providing materials to journalists and regional education offices
Data files	Inform policy, provide pedagogical support, and hold schools accountable, depending on research topic, to researchers
Data analysis tool	Inform policy, provide pedagogical support, and hold schools accountable, depending on the type of analysis, for researchers and decision makers
Geo-referential system	Google Maps with the geographical location of schools and their mean scores for parents to hold schools accountable
MEHRD website	Inform policy, provide pedagogical support, and hold schools accountable

Source: Ramirez 2013.

Regular announcements of the reports published via e-mails, postal services, and newspapers could increase awareness. These dissemination materials ensure utilization of information from parents to schools to education authorities and national governments. The lack of utilization of data to improve student learning is voiced by parents in Solomon Islands (box 3).

Box 3: Voices of Parents

“Some schools delay in sending report cards, and these days could range for more than a year”—Parent in a discussion with author, March 2015

“Number of students at each school level should be made public”—Parent in a discussion with author, March 2015

“Parents should be able to know which schools are performing well” —Parent in a discussion with author, March 2015

“There is no legal mandate that the parents can use to make schools accountable” —Parent in discussion with the author, March 2015

“Parents should be able to know which schools are performing well” —Parent in a discussion with author, March 2015

Recommendations and Proposed Support

This section presents a set of recommendations and proposed activities based on the assessment of EMIS in Solomon Islands (table 5). Recommendations and activities aim to improve overall EMIS functionality in a sustainable and effective manner to ensure better access and use of information for decision making, planning, and student learning. The Strengths, Weaknesses, Opportunities, and Threats (SWOT) profile (figure 12) summarizes key points from the needs assessment and informs recommendations.

Table 5: Solomon Islands EMIS Rankings

1. Enabling Environment	Latent ●○○○
2. System Soundness	Emerging ●●○○
3. Quality Data	Emerging ●●○○
4. Utilization for Decision Making	Latent ●○○○

Figure 12: Solomon Islands EMIS SWOT Profile

<p>Strengths</p> <ul style="list-style-type: none"> • Strong <i>political buy-in</i> from high-level officials • The <i>National Education Action Plan</i> (NEAP) lays the foundation for EMIS • Linkage of the education statistics with the overall education <i>strategy</i> • A <i>system is already established</i> at the central level • <i>Data analysis tools</i> already exist 	<p>Weaknesses</p> <ul style="list-style-type: none"> • Detailed <i>policies</i> supporting EMIS operations do not exist • Lack of <i>integration</i> of different education databases (e.g., assessment/ finance) into EMIS • <i>EMIS processes not expanded</i> to the provincial level • Limited <i>auditing/validation</i> mechanisms • Flaws in the system that create adverse incentives for schools to <i>report</i> inflated education data • Poor <i>internet</i> access, especially in remote areas, which inhibits technological activities in the country • <i>Manual processing</i> of data • <i>No revisions or updates</i> to school census forms • <i>Limited involvement</i> of Education Authorities • <i>Professional development</i> activities for staff are limited • Long delays in <i>production</i> of Performance Assessment Reports
<p>Opportunities</p> <ul style="list-style-type: none"> • <i>Involvement of education authorities</i> beyond collection and distribution of census forms • Quality of feedback <i>reports</i> provided to schools could be enhanced • Creating awareness, <i>publicizing</i>, and regularly updating the content of the existing MEHRD website • <i>Designating MEHRD officials and Education Authorities closer to schools</i> (especially in remote areas) to manage/ monitor them • Existing <i>donor funding</i> could be channeled through government systems 	<p>Threats</p> <ul style="list-style-type: none"> • Heavy dependence on donors threatens the long-term <i>sustainability</i> of the system • <i>Weak capacity</i> of primary data providers and officials at the local level • Limited channels for <i>communication</i> to inform and update stakeholders • Limited <i>communication and coordination</i> across different units in the Ministry

Institutionalization of EMIS as the core management information system of the government would require strong policies and a dedicated EMIS budget. Heavy dependence on donors to fund its core operations, such as infrastructure, has resulted in a lack of investment dedicated toward its maintenance and long-term sustainability. As a next step, a policy should be developed that focus on EMIS as the single point of reference for data collection, processing, and dissemination with a dedicated budget allocated towards its operations. Funds from donors should also be routed through the government systems.

The policy should include clearly outlined mandatory practices to be adopted by various education stakeholders at each level of the education system. A well-defined EMIS policy should have clearly stated procedures and regulations for (a) central, local, and school reporting requirements, (b) defined responsibility and ownership of data, (c) allocation of EMIS budget, (d) data collection processes, (e) data submission requirements, (f) procurement guidelines (if purchasing the software/hardware from an external vendor), (g) technical specifications of EMIS, (h) type of data collected, (i) data validation mechanisms (internal and external), (j) confidentiality clauses, (k) dissemination strategy, (l) extent to which data should be utilized by stakeholders, (m) code of conduct for staff, and (n) professional development activities.

Efforts should be made to improve the local capacity of EMIS staff by investing in their professional development activities. Currently the EMIS team is staffed with people who do not have any technical expertise in the area of EMIS or database systems. As a result, any breakdown in the system makes them dependent on the support of vendors. Regular training and support should be provided to make staff more self-sufficient. A stronger push is needed from the government to invest in these types of resources. Some initiatives have been in the pipeline, like the development of the EMIS Regional design facility by the Secretariat for the Pacific Community to provide continuous on-the-job training to staff.

EAs should be involved in the process of data collection, processing, and dissemination. EMIS in Solomon Islands is a centralized and hierarchal initiative, with the schools

feeding data directly to EMIS. EAs could be instrumental in assisting schools to complete census forms and ensure timely submission of data to MEHRD. They could also be involved in monitoring the quality of data provided by schools, which would make them accountable. Providing them access to EMIS data would ensure more effective utilization of information at the local level and increase the accuracy and reliability of source data.

The type of data collected and indicators produced by EMIS must be reviewed and further developed to include student-level data. Currently the annual census collects aggregate data on students. A head count approach is used to estimate the enrollment rates and other education statistics. Collecting individual-level data would provide more useful information to schools, teachers, and parents as well as increase their engagement in the process. Workshops with the EMIS team and different departments within MEHRD should be conducted to review data needs and revise census forms accordingly.

Integration of other education databases into EMIS would result in more effective utilization of education data for decision making. Currently EMIS is a standalone system, containing basic demographic information on schools. Student assessment data are fed into a separate information system (ATLAS), which contains data on literacy and numeracy skills. Besides assessment, there is a human resource management information system and financial information system, which are not integrated with EMIS either. The government should develop a strategy to encourage dialogues among different stakeholders to integrate all the existing education databases.

EMIS needs to be supported by regular internal and external audits to improve the accuracy of data collected and utilized in decision making. The SIGP creates adverse incentives for schools to report inflated data to receive increased funding. As such, validation procedures to verify data collected from schools becomes even more critical. Posting MEHRD officers and education authorities in provinces (both rural and urban) to monitor schools closely would go a long way in improving the accuracy and reliability of source data. In addition, stronger automated tools to deal with missing values and identify suspicious data could be developed.

Specialized workshops should be held in schools to instill a data-driven culture among educators.

Utilization of data requires a shift in behavior and social norms, making communication campaigns a useful tool. Specialized training courses should be conducted for principals and teachers to (a) train them on the effective use of the EMIS feedback report and (b) teach them how to complete school census forms. This is especially important when a new principal or staff is appointed who has little knowledge on completing these forms.

The quality of feedback reports sent to schools should be enriched with more relevant microlevel information on school performance.

Currently MEHRD sends a two-page feedback document to every school, which contains a brief summary on school enrollment history, a breakdown of enrollment by gender and class level, repetition rates by grade, and student-teacher ratio. Although this is a useful tool for knowing the basic education statistics of a school, it does not give any information about school performance. Enriching the

report by providing detailed information on student performance in examinations, absenteeism rates, school expenditures, management of resources, and so on would be a more useful tool for school managers and teachers.

Clearly articulated data utilization and dissemination strategies need to be developed, including processes to ensure the timely production of an annual statistics handbook, as well as additional utilization and dissemination opportunities such as pamphlets and web-based portals.

The PAR gets published once every two years because of considerable delays in data collection and processing. Efforts need to be made to ensure annual production of these statistics. Also, MEHRD needs to put in place a dissemination strategy to create awareness and build a data-driven culture. Regular announcements via e-mails, as well as monthly/quarterly updates on education statistics, would go a long way in broadening the number of recipients and engaging stakeholders across the country.

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Acronyms

EA	Education Authority
ECE	Early Childhood Education
EMIS	Education Management Information Systems
ISCED	International Standard Classification of Education
MEHRD	Ministry of Education and Human Resource Development
NEAP	National Education Action Plan
PaBER	Pacific Benchmarking for Education Results
PAR	Performance Assessment Report

PCRU	Planning, Coordination and Research Unit
PINEAPPLES	Pacific Island Nation Evaluation Analysis Policy and Planning Leveraging Education Statistics
SIEMIS	Solomon Islands Education Management Information Systems
SIGP	Solomon Islands Grants Policy

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³ PaBER is funded by the Australian government and is coordinated through the Educational Quality and Assessment Programme (formerly the South Pacific Board for Educational Assessment).

Appendix A: Summary of Policy Lever Benchmarking

Policy Area	Policy Lever	Score*	Weight	Benchmark
Enabling environment	Legal framework	1.12	15%	Emerging
	Organizational structure and institutionalized processes	1.78	15%	Emerging
	Human resources	0.64	15%	Latent
	Infrastructural capacity	1.24	15%	Emerging
	Budget	0.00	15%	Latent
System soundness	Data-driven culture	0.57	10%	Latent
	Data architecture	1.90	20%	Emerging
	Data coverage	1.34	30%	Emerging
	Data analytics	1.78	15%	Emerging
	Dynamic system	1.04	15%	Emerging
Quality data	Serviceability	1.67	20%	Emerging
	Methodological soundness	2.78	25%	Established
	Accuracy and reliability	1.42	25%	Emerging
	Integrity	0.78	25%	Latent
	Periodicity and timeliness	0.67	25%	Latent
Utilization in decision making	Openness	0.13	15%	Latent
	Operational use	1.13	50%	Emerging
	Accessibility	1.20	20%	Emerging
	Effectiveness in disseminating findings	0.80	15%	Latent

*0–0.9 = Latent; 1–1.9 = Emerging; 2–2.9 = Established; 3–4 = Advanced.

Appendix B: Extended Rubric, Solomon Islands Scores Highlighted Red

Policy Levers		Indicators	Description of Best Practices	Scoring			
				Latent	Emerging	Established	Advanced
POLICY AREA 1: ENABLING ENVIRONMENT		Institutionalization of system: EMIS is institutionalized as an integral part of the education system and the government Responsibility: responsibility for collecting, processing, and disseminating education statistics is given to a clearly designated institution or agency Dynamic framework: the legal framework is dynamic and elastic so that it can adapt to advancements in technology Data supply: the legal framework mandates that schools participate in EMIS by providing education data Comprehensive, quality data: the requirement for comprehensive, quality data is clearly specified in the EMIS legal framework	The system contains crucial components of a comprehensive enabling environment, which addresses related policy elements and enables the functioning of an effective and dynamic system There is an existing legal framework to support a fully functioning EMIS	The system lacks major components of a comprehensive enabling environment	The system contains basic components of a comprehensive enabling environment	The system contains most components of a comprehensive enabling environment	The system contains crucial components of a comprehensive enabling environment
				A legal framework is not in place	Basic components of a legal framework or informal mechanisms are in place	Most elements of a legal framework are in place	An existing legal framework supports a fully functioning EMIS
1.1	Legal framework						

Policy Levers	Indicators	Description of Best Practices	Scoring			
			Latent	Emerging	Established	Advanced
	<p>Data sharing and coordination: the legal framework allows for adequate data sharing and coordination between the Ministry of Education and agencies and/or institutions that require education data</p> <p>Utilization: the legal framework emphasizes data-driven education policy</p> <p>Budget: the education system budget includes a line item for EMIS</p> <p>Confidentiality: the legal framework guarantees that respondents' data are confidential and used for the sole purpose of statistics</p>					
1.2 Organizational structure and institutionalized processes	<p>Organizational structure and institutionalized processes</p>	<p>The system is institutionalized within the government, has well-defined organizational processes, and has several functionalities beyond statistical reporting</p>	<p>The system is not specified in policies, and what exists does not have well-defined organizational processes; EMIS has limited functionalities</p>	<p>The institutional structure of the system is not clearly specified in policies, it has some organizational processes, and its functionalities are limited</p>	<p>The institutional structure of the system is defined within the government, it has defined organizational processes, but its functionalities are limited</p>	<p>The system is institutionalized within the government, has well-defined organizational processes, and has several functionalities beyond statistical reporting</p>
1.3 Human resources	<p>Personnel: the core tasks of EMIS are identified and EMIS is staffed with qualified people</p>	<p>Qualified staff operate the system, and opportunities are available to improve their performance and retention</p>	<p>Minimum standards of qualification are not met for the majority of staff that operate the system and opportunities are not available to improve</p>	<p>Some staff are qualified to operate the system and limited opportunities are available to improve staff</p>	<p>The majority of staff are qualified to operate the system, and frequent opportunities are available to improve</p>	<p>All staff are qualified to operate the system, and well-established opportunities are constantly available to improve staff</p>

Policy Levers		Indicators	Description of Best Practices	Scoring			
				Latent	Emerging	Established	Advanced
		Professional development: professional training is available for EMIS staff		their performance and retention	performance and retention	staff performance and retention	performance and retention
1.4 Infrastructural capacity		Data collection: tools for data collection are available	The system has a well-defined infrastructure to perform data collection, management, and dissemination functions in an integral manner	The system lacks a well-defined infrastructure	The system has a basic or incomplete infrastructure	The system has an infrastructure that allows it to perform some of its functions in an integral manner	The system has a well-defined infrastructure to fully perform its data collection, management, and dissemination functions in an integral manner
		Database(s): databases exist under the umbrella of the data warehouse and have both hardware and software means Data management system: a system is in place that manages data collection, processing, and reporting Data dissemination: data dissemination tools are available and maintained by the agency producing education statistics					
1.5 Budget		Personnel and professional development: the EMIS budget contains a specific budget for EMIS personnel and their professional development	The system budget is comprehensive, ensuring that the system is sustainable and efficient	The system suffers from serious budgetary issues	The system has a basic or incomplete budget	The system budget contains the majority of required categories to ensure that most parts of the system are sustainable and efficient	The system budget is comprehensive, ensuring that the system is sustainable and efficient
		Maintenance: the EMIS budget contains a specific budget for system maintenance and recurrent costs Reporting: the EMIS budget contains a specific budget for reporting costs Physical infrastructure: the EMIS budget contains a specific budget for physical infrastructure costs					

Policy Levers		Indicators	Description of Best Practices	Scoring			
				Latent	Emerging	Established	Advanced
		Efficient use of resources: processes and procedures are in place to ensure that resources are used efficiently					
	Data-driven culture	Data-driven culture	A data-driven culture prioritizes data as a fundamental element of operations and decision making, both inside and outside of the education system	The system suffers because there is not a data-driven culture that prioritizes data management and data utilization in decision making	The system has a data-driven culture that demonstrates a basic appreciation of data and interest in developing better data utilization practices	A data-driven culture exists that prioritizes data management and utilization within and beyond the education system, and evidence of that culture is present in daily interaction and decision making at all levels	
POLICY AREA 2: SYSTEM SOUNDNESS			The processes and structure of EMIS are sound and support the components of an integrated system	The system lacks processes and structure	The system has basic processes and a structure that do not support the components of an integrated system	The system has some processes and a structure, but they do not fully support the components of an integrated system	The processes and structure of the system are sound and support the components of an integrated system
2.1	Data architecture	Data architecture	The data architecture is well defined to ensure full system functionality	The system's data structure does not have a well-defined data architecture	The system's data architecture includes some components; however, it is incomplete	The system's data structure has most elements of the data architecture; however, it has some deficiencies that affect the system's functionality	The data architecture is well defined to ensure full system functionality
2.2	Data coverage	Administrative data: EMIS contains administrative data Financial data: EMIS contains financial data	The data in the system is comprehensive and covers administrative, financial, human	The data in the system are far from being comprehensive and coverage is limited	The data in the system include some of the data areas	The data in the system include most but not all of the data areas	The data in the system are comprehensive and cover all data areas

Policy Levers	Indicators	Description of Best Practices	Scoring			
			Latent	Emerging	Established	Advanced
2.3 Data analytics	Human resources data: EMIS contains human resources data	resources, and learning outcomes data				
	Learning outcomes data: EMIS contains learning outcomes data					
2.4 Dynamic system	Data analytics	Tools and processes are available to perform data analytics at different levels on a regular basis	There are tools and processes to perform limited tabulations	Basic tools and processes are available, but the system is not capable of conducting advanced analytical steps (e.g., predictive models, projections)	Tools and processes are available; however, data analytics are not performed regularly	Tools and processes are available to perform data analytics at different levels on a regular basis
	Quality assurance measures: the system is dynamic and maintains quality assurance measures Data requirements and considerations: there are mechanisms for addressing new and emerging data requirements System adaptability: EMIS is elastic and easily adaptable to allow for changes and/or advancements in data needs	The system in place is not easily adaptable to changes/advancements in data needs	The system in place is not easily adaptable and requires significant time and resources to accommodate changes and/or advancements	The system in place is easily adaptable, but it remains reasonably complex	The system in place is elastic and easily adaptable to allow for changes/advancements in data needs	
2.5 Serviceability	Validity across data sources: information brought together from different data and/or statistical frameworks in EMIS is placed within the data warehouse using structural and consistency measures	Services provided by the system are valid across data sources, integrate noneducation databases into EMIS, and archive data at the	There are serious issues related to data validity and consistency	There are inconsistencies related to data validity and consistency	The data are consistent and valid; however, some concerns still exist	Services provided by the system are valid across data sources, integrate noneducation databases into EMIS, and archive data at the

Policy Levers		Indicators	Description of Best Practices	Scoring			
				Latent	Emerging	Established	Advanced
		<p>Integration of noneducation databases into EMIS: data from sources collected by agencies outside of EMIS are integrated into the EMIS data warehouse</p> <p>Archiving data: multiple years of data are archived, including source data, metadata, and statistical results</p> <p>Services to EMIS clients: services provided by the system to EMIS clients include ensuring the relevance, consistency, usefulness, and timeliness of its statistics</p>	<p>service of EMIS clients by ensuring the relevance, consistency, usefulness, and timeliness of its statistics</p>				<p>service of EMIS clients by ensuring the relevance, consistency, usefulness, and timeliness of its statistics</p>
POLICY AREA 3: QUALITY DATA			<p>The system has the mechanisms required to collect, save, produce, and utilize information, which ensures accuracy, security, and timely, high-quality information for use in decision making</p>	<p>The system lacks mechanisms to collect, save, or produce timely, high-quality information for decision making</p>	<p>The system has basic mechanisms to collect, save, and produce timely, quality information; however, its accuracy might be questionable</p>	<p>The system has most mechanisms in place needed to collect, save, and produce timely, high-quality information for use in decision making; however, some additional measures are needed to ensure accuracy, security, and/or timely information that can be used for decision making</p>	<p>The system has the required mechanisms in place to collect, save, produce, and utilize information, which ensures accuracy, security, and timely, high-quality information for use in decision making</p>

Policy Levers		Indicators	Description of Best Practices	Scoring			
				Latent	Emerging	Established	Advanced
3.1	Methodological soundness	Concepts and definitions: data fields, records, concepts, indicators, and metadata are defined and documented in official operations manuals along with other national datasets, and endorsed by the government	The methodological basis for producing educational statistics from raw data follows internationally accepted standards, guidelines, and good practices	The methodological basis for producing educational statistics does not follow internationally accepted standards, guidelines, or good practices	The methodological basis for producing educational statistics follows the basics of internationally accepted standards, guidelines, and good practices	The methodological basis for producing educational statistics follows most required internationally accepted standards, guidelines, and good practices	The methodological basis for producing educational statistics from raw data follows internationally accepted standards, guidelines, and good practices
		Classification: defined education system classifications are based on technical guidelines and manuals					
3.2	Accuracy and reliability	Scope: the scope of education statistics is broader than and not limited to a small number of indicators (e.g., measurements of enrollment, class size, and completion)	Source data and statistical techniques are sound and reliable, and statistical outputs sufficiently portray reality	Source data and statistical techniques have basic soundness and reliability, but statistical outputs do not portray reality	Source data and statistical techniques follow most required elements to be sound and reliable, but statistical outputs do not portray reality	Source data and statistical techniques are sound and reliable, and statistical outputs sufficiently portray reality	
		Basis for recording: data recording systems follow internationally accepted standards, guidelines, and good practices					
		Source data: available source data provide an adequate basis for compiling statistics	Source data and statistical techniques are sound and reliable, and statistical outputs sufficiently portray reality	Source data and statistical techniques have basic soundness and reliability, but statistical outputs do not portray reality	Source data and statistical techniques follow most required elements to be sound and reliable, but statistical outputs do not portray reality	Source data and statistical techniques are sound and reliable, and statistical outputs sufficiently portray reality	
		Validation of source data: source data are consistent with the definition, scope, classification, as well as time of recording, reference periods, and valuation of education statistics	Source data and statistical techniques are sound and reliable, and statistical outputs sufficiently portray reality	Source data and statistical techniques have basic soundness and reliability, but statistical outputs do not portray reality	Source data and statistical techniques follow most required elements to be sound and reliable, but statistical outputs do not portray reality	Source data and statistical techniques are sound and reliable, and statistical outputs sufficiently portray reality	
		Statistical techniques: statistical techniques are used to calculate accurate rates and derived indicators	Source data and statistical techniques are sound and reliable, and statistical outputs sufficiently portray reality	Source data and statistical techniques have basic soundness and reliability, but statistical outputs do not portray reality	Source data and statistical techniques follow most required elements to be sound and reliable, but statistical outputs do not portray reality	Source data and statistical techniques are sound and reliable, and statistical outputs sufficiently portray reality	

Policy Levers		Indicators	Description of Best Practices	Scoring			
				Latent	Emerging	Established	Advanced
3.3	Integrity	Professionalism: EMIS staff exercise their profession with technical independence and without outside interference that could result in the violation of the public trust in EMIS statistics and EMIS itself	Education statistics contained within the system are guided by principles of integrity	Education statistics contained within the system are mostly guided by principles of integrity (1 of the 3 principles of professionalism, transparency, and ethical standards)	Education statistics contained within the system are mostly guided by principles of integrity (2 of the 3 principles of professionalism, transparency, and ethical standards)	Education statistics contained within the system are guided by all 3 principles of integrity: professionalism, transparency, and ethical standards	
		Transparency: statistical policies and practices are transparent		Education statistics contained within the system are guided by limited principles of integrity (1 of the 3 principles of professionalism, transparency, and ethical standards)	Education statistics contained within the system are mostly guided by principles of integrity (2 of the 3 principles of professionalism, transparency, and ethical standards)		
3.4	Periodicity and timeliness	Ethical standards: policies and practices in education statistics are guided by ethical standards	The system produces data and statistics periodically in a timely manner	The system produces some data and statistics periodically and in a timely manner	The system produces most data and statistics periodically and in a timely manner	The system produces all data and statistics periodically and in a timely manner	
		Periodicity: the production of reports and other outputs from the data warehouse occur in accordance with cycles in the education system		The system produces data and statistics periodically and in a timely manner	The system produces most data and statistics periodically and in a timely manner		
POLICY AREA 4: UTILIZATION FOR DECISION MAKING				The system is used by most education stakeholders but is not fully operational in governmental decision making	The system is used by most education stakeholders but is not fully operational in governmental decision making	The system is wholly utilized by different users for decision making at different levels of the education system	
4.1	Openness	Timeliness: final statistics and financial statistics are both disseminated in a timely manner	There are no signs that EMIS is utilized in decision making by the majority of education stakeholders	The system is open to some education stakeholders in terms of their awareness and capacity to utilize the system	The system is open to the majority of education stakeholders in terms of their awareness and capacity to utilize the system	The system is open to all education stakeholders in terms of their awareness and capacity to utilize the system	
		EMIS stakeholders: EMIS primary stakeholders are identified and use the system in accordance with the legal framework		The system lacks openness to education stakeholders in terms of their awareness and capacity to utilize the system	The system is open to some education stakeholders in terms of their awareness and capacity to utilize the system	The system is open to the majority of education stakeholders in terms of their awareness and capacity to utilize the system	The system is open to all education stakeholders in terms of their awareness and capacity to utilize the system
		User awareness: current and potential EMIS users are aware of EMIS and its outputs	The system is open to education stakeholders in terms of their awareness and capacity to utilize the system	The system is open to some education stakeholders in terms of their awareness and capacity to utilize the system	The system is open to the majority of education stakeholders in terms of their awareness and capacity to utilize the system	The system is open to all education stakeholders in terms of their awareness and capacity to utilize the system	

Policy Levers	Indicators	Description of Best Practices	Scoring			
			Latent	Emerging	Established	Advanced
	User capacity: EMIS users have the skills to interpret, manipulate, and utilize the data produced by the system to ultimately disseminate findings				capacity to utilize the system	
4.2 Operational use	Utilization in evaluation: data produced by EMIS are used to assess the education system					
	Utilization in governance: data produced by EMIS are used for governance purposes					
	Utilization by schools: data produced by EMIS are used by schools Utilization by clients: data produced by EMIS are used by clients (including parents, communities, and other actors) Utilization by government: the system is able to produce summative indicators (derived variables) to monitor education system	Data produced by the system are used in practice by the main education stakeholders	Data produced by the system are not used in practice by education stakeholders	Data produced by the system are used in practice by some education stakeholders	Data produced by the system are used in practice by the majority of education stakeholders	Data produced by the system are used in practice by the main education stakeholders
4.3 Accessibility	Understandable data: data are presented in a manner that is easily digestible	Education statistics are presented in an understandable manner, are widely disseminated using clear platforms for utilization, complemented by user support				
	Widely disseminated data: education statistics are disseminated beyond the Ministry of Education and/or the education statistics-producing agency to other EMIS stakeholders Platforms for utilization: platforms are standardized across EMIS and are customizable to user needs	Education statistics are presented in an understandable manner, are widely disseminated using clear platforms for utilization, complemented by user support	The system suffers from serious accessibility issues	The system has major accessibility issues	The system has minor accessibility issues	Education statistics are presented in an understandable manner and are widely disseminated using a clear platform for utilization, complemented by user support

Policy Levers	Indicators	Description of Best Practices	Scoring			
			Latent	Emerging	Established	Advanced
	User support: assistance is provided to EMIS users upon request to help them access the data					
4.4 Effectiveness in disseminating findings	Dissemination strategy: national governments have an information dissemination strategy in place Dissemination effectiveness: dissemination of EMIS statistics is effective	Dissemination of education statistics via an EMIS is strategic and effective	Dissemination is neither strategic nor effective	Dissemination is reasonably strategic, but ineffective	A dissemination plan has been implemented; however, there is room for improvement (for full effectiveness in relation to strategic engagement)	The dissemination of education statistics via an EMIS is strategic and effective

The **Systems Approach for Better Education Results (SABER)** initiative collects data on the policies and institutions of education systems around the world and benchmarks them against practices associated with student learning. SABER aims to give all parties with a stake in educational results—from students, administrators, teachers, and parents to policy makers and business people—an accessible, detailed, objective snapshot of how well the policies of their country's education system are oriented toward ensuring that all children and youth learn.

This report focuses specifically on policies in the area of **Education Management Information Systems**.

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