Stated Briefly

Benchmarking education management information systems across the Federated States of Micronesia

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This brief identifies the similarities and differences in the quality of education management information systems across the Federated States of Micronesia, which includes the four states of Chuuk, Kosrae, Pohnpei, and Yap. During focus group sessions that explored the methods and processes used to collect, analyze, report on, and disseminate education data, data specialists in all four states rated their systems as either established or emerging.

Why these studies?

The chief state school officers of the Federated States of Micronesia have called for improving the education management information system (EMIS) in each of the country's four states (Chuuk, Kosrae, Pohnpei, and Yap), especially the organization and collection of data and the timeliness of data reports (FSM Association of Chief State School Officers, 2009). An EMIS encompasses all elements related to the collection, storage, and processing of data to formulate, manage, and evaluate education management policies.

This brief synthesizes the findings of reports on benchmarking the education management information system in Chuuk, Kosrae, and Pohnpei (Kendall, Dandapani, & Cicchinelli, 2016) and in Yap (Cicchinelli, Kendall, and Dandapani, 2016); the reports are available at http://ies.ed.gov/ncee/edlabs/projects/project.asp?projectID=4471.

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A 2010 audit of compliance with performance criteria around programs and responsibilities by the Federated States of Micronesia National Department of Education underscored the need for better data communication systems—the networking, delivery, and reporting of data within the national department and between it and the states. The audit also recommended that the national and state departments of education improve the uniformity and accuracy of data collection (Wrembeck & Fenlon, 2010). Data specialists in each state have also suggested room for improvement or fuller implementation of data communication system processes (Cicchinelli & Spencer, 2014). To build on the findings at the individual state level, Regional Educational Laboratory (REL) Pacific worked in partnership with Chuuk, Kosrae, Pohnpei, and Yap to conduct separate assessments of the quality of the current EMIS in each state (Cicchinelli, Kendall, & Dandapani, 2016; Kendall, Dandanapi, & Cicchinelli, 2016a, 2016b, 2016c). This brief integrates the findings from all four state studies, including comparisons of each aspect of quality.

In all four states of the Federated States of Micronesia education data are critical to demonstrating compliance with programmatic and grant-funding requirements. Improving the quality of data and the rigor of education data systems is a central issue in the country (Levine, 2010; U.S. Government Accountability Office, 2006, 2013). The quality of any data management system (for example, an EMIS, a state longitudinal data system, or a data warehouse) is key to ensuring that education policy, planning, and strategy decisions are grounded in accurate data (Data Quality Campaign, 2010; Mohamed, Kadir, May-Lin, Rahman, & Arshad, 2009; Regional Educational Laboratory Southeast, 2010; World Bank, 2011; for a detailed review of the literature, see appendix A in Cicchinelli et al., 2016, and Kendall et al., 2016a, 2016b, 2016c). However, in the Federated States of Micronesia the lack of complete, reliable, consistent, and high-quality data impedes effective analysis and education reform (U.S. Government Accountability Office, 2013). In three annual reports on education indicators to the Joint Economic Management Committee, which oversees the allocation and use of funds from the U.S. Department of the Interior's Office of Insular Affairs Compact, the Federated States of Micronesia National Department of Education noted that it faced challenges with timely data submission and data verification (Federated States of Micronesia, 2012, 2013, 2014).

This brief highlights strengths and areas needing improvement for each state's EMIS. Comparing findings on the quality of EMISs across states may help inform future policy and planning conversations in the Federated States of Micronesia Department of Education, which is charged with developing and implementing an overall national education data system improvement plan focused on data management, system improvement, and coordination at both the national and state levels.

What the studies examined

To examine the quality of the EMISs in each state of the Federated States of Micronesia, REL Pacific adapted a focus group protocol developed by the World Bank (2011) for identifying the characteristics of an EMIS and comparing systems within a country over time or comparing systems across countries. REL Pacific revised the World Bank's System Assessment and Benchmarking for Education Results (SABER) EMIS Assessment Tool protocol, which includes a rating system to characterize the strengths and weaknesses of an EMIS, to include questions for each indicator in order to prompt discussion among focus group participants. Referred to as data specialists, these focus group participants included managers and staff from the data division, along with representatives from other divisions that work with EMIS data, such as special education, assessment, school improvement, and professional development. The study team also adapted some aspects of the international indicators and scoring guidelines established by the World Bank to better

reflect the system development and operating context in the Federated States of Micronesia. The revised SABER instrument included 46 indicators and assessed the following five aspects of system quality:

1. *Prerequisites of quality.* Assesses whether the institutional frameworks that govern the information systems and data reporting and their supporting resources are available and adequate. This aspect has two subsections: the legal and institutional environment and whether human and material resources are adequate for the task. (11 indicators)

2. *Integrity of education statistics.* Assesses whether the professionalism, objectivity, transparency, and ethical standards by which data staff operate and by which the data and statistics are reported are adequate. This aspect has three subsections: whether statistical policies and practices are guided by professional principles, whether those policies and practices are transparent, and whether they are guided by ethical standards. (9 indicators)

3. *Accuracy and reliability of education statistics.* Assesses whether the data and statistical techniques are sound and whether statistical reports reflect reality. (10 indicators)

4. *Serviceability (relevance, timeliness, and consistency).* Assesses whether the data being collected and the education statistics being generated are relevant and available to inform policy and practice decisions and are consistent over time to measure progress. (7 indicators)

5. *Accessibility.* Assesses whether the education statistics (and their underlying metadata) are made available in clear and understandable ways to stakeholders. (9 indicators)

Each indicator focuses on a specific characteristic of an aspect of quality; for example, one indicator under the serviceability aspect concerns whether statistics are released on a preannounced schedule. Indicators are supplemented with a focusing question and clarifying statements ranging from a few sentences to several paragraphs that provide examples or context for the indicator.

The question for each indicator in the focus group protocol can be answered on a fixed five-point scale from 0 (latent) to 1 (mature). The scores for each indicator (0, .25, .50, .75, and 1.0) can be placed within the range of scores that define one of the four benchmarks: latent, emerging, established, and mature (table 1). The scores for each indicator within an aspect of quality were averaged across data specialists to provide a sense of relative strengths and weaknesses within the quality aspect. These indicator scores were then

Table 1. Descriptions of benchmark levels for indicator scores and overall score range for aspects of quality

Benchmark level	Description	Indicator score	Score range for benchmark level
Latent	The process or action required to improve the aspect of quality is not in place	.00	.00–.30
Emerging	The process or action is in process of implementation	.25 and .50	.31–.59
Established	The process or action is in place and it meets standards	.75	.60–.79
Mature	The process or action is an example of best practice	1.00	.80–1.00

Note: The World Bank's System Assessment and Benchmarking for Education Results Education Management Information System Assessment Tool uses a fixed five-point scale for rating each indicator. The score ranges for the benchmark levels are assigned to each aspect of quality on the basis of averaged indicator scores; the individual indicator scores and the score ranges for the benchmark levels may not directly align (as in the emerging benchmark level). The tool does not indicate how the score ranges for the benchmark levels were developed.

Source: Adapted from World Bank (2011), pp. 40, 46.

averaged and used to assign the aspect to a benchmark level. The overall score for the EMIS was calculated by averaging the scores for all five aspects and assigning the result to the applicable benchmark level.

How the studies were conducted

Using the adapted SABER EMIS Assessment Tool protocol, the study team conducted a focus group with data specialists in each state. During sessions that lasted up to a day and a half, the data specialists discussed and rated the processes, tools, and materials they have available to support the collection, analysis, and reporting of timely and meaningful data to schools or agencies within their education departments. Data specialists also had the opportunity to bring to the focus group any evidence—regulations, logs, forms, and other artifacts—that supported their perspective on how the indicators should be rated. Data specialists in each state were nominated by their departments for their familiarity with their state's EMIS. The number of data specialists participating in each focus group ranged from four to eight, and their titles and roles varied (for example, data clerk, data manager, and assessment and special education coordinator).

What the studies found

This section provides an overview of study findings across the four states of the Federated States of Micronesia. Ratings are presented first for the overall EMIS in each state, followed by ratings for each of the five aspects of system quality.

Overall education management information systems were rated as either established or emerging in all four states

Data specialists in Kosrae, Pohnpei, and Yap rated their state's overall system as established, based on a simple average of aggregate scores for all aspects of quality. The average overall rating was .75 for Kosrae, .67 for Pohnpei, and .64 for Yap (figure 1).

Figure 1. Data specialists in Kosrae, Pohnpei, and Yap rated their state's overall education management information system as established
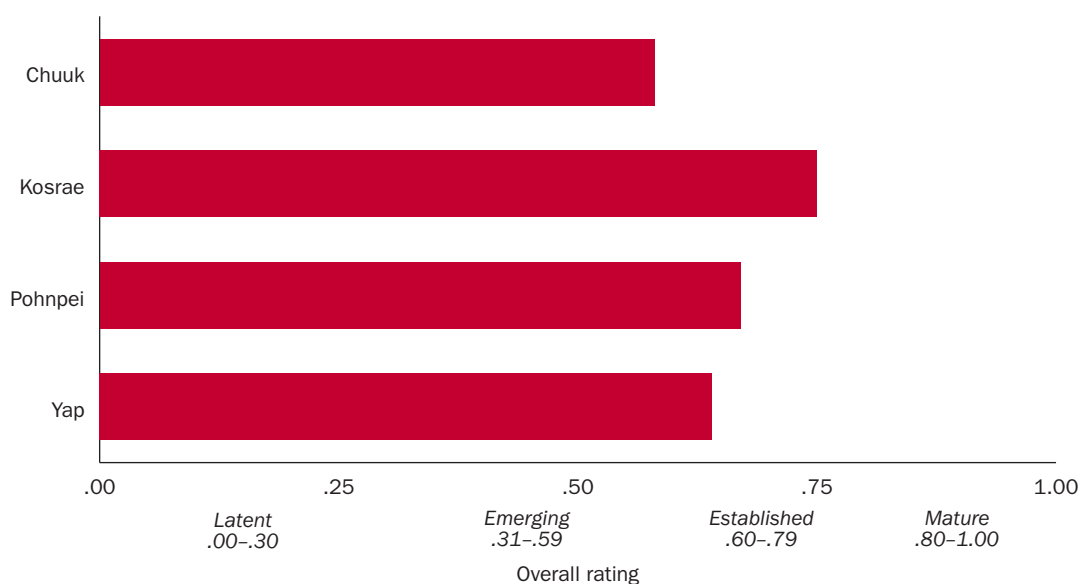
Source: Authors' calculations based on participant responses during focus group sessions in each state in 2014.

The SABER EMIS Assessment Tool describes the established benchmark level for the overall system as:

> Stable channels of data collection and production. There is a clear strategy and investment in data and statistics. More varied sources of data including sample-based surveys. Some emerging policy issues are addressed in terms of measurement. Regional and international comparisons are frequently cited (World Bank, 2011, p. 48).

Data specialists in Chuuk rated their state's overall system as emerging, with an average score of .58 (see figure 1). The SABER EMIS Assessment Tool describes the emerging benchmark level for the overall system as:

> Basic data channels in place though still weaknesses in reporting by providers; some commitment to data use; data are still fragmented across ministries; coverage and relevance needs large improvement; some regional benchmarks used (World Bank, 2011, p. 48).
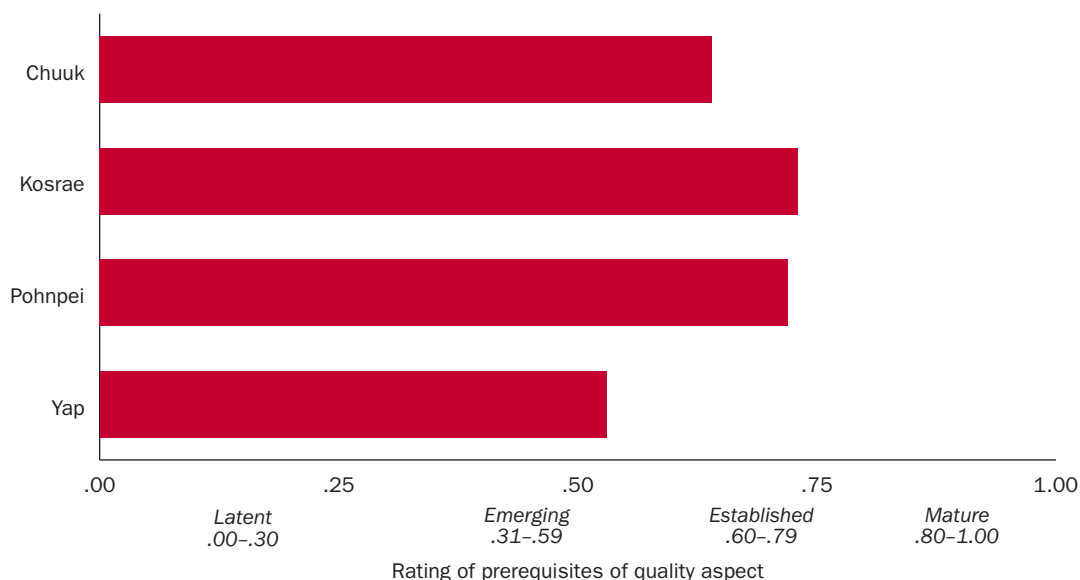
In three states the prerequisites of quality aspect was rated as established

Data specialists in each state rated the prerequisites of quality aspect as established in Chuuk (average score of .64), Kosrae (average score of .73), and Pohnpei (average score of .72) and as emerging (average score of .53) in Yap (figure 2).

In all four states the integrity of education statistics aspect was rated as either established or emerging
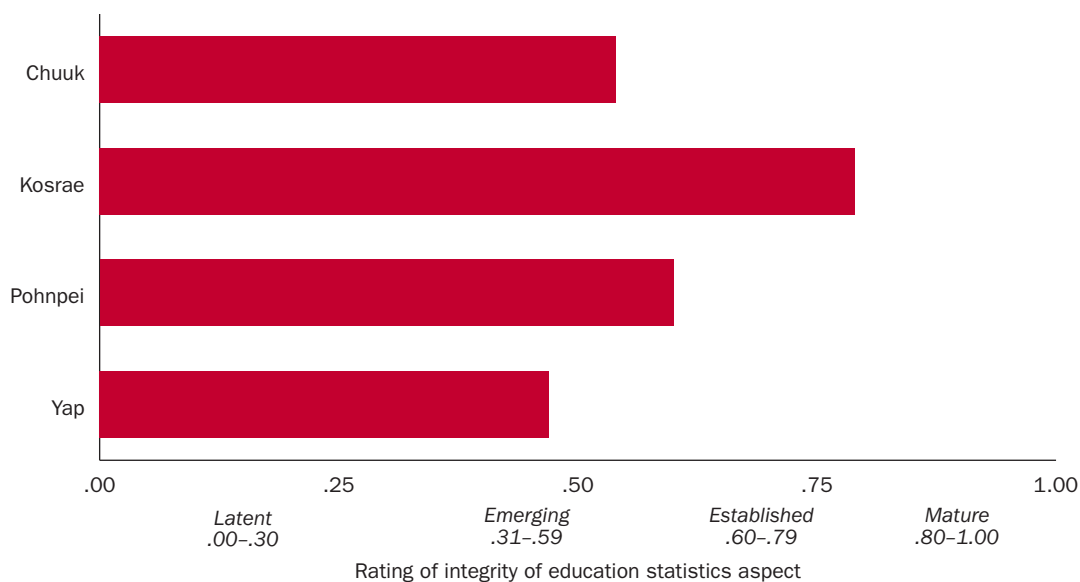
The highest rating for the integrity of education statistics aspect was in Kosrae, with an average score of .79, at the top of the established benchmark level (figure 3). Data specialists in each state rated the aspect as established in Pohnpei (average score of .60) and as emerging in Chuuk (average score of .54) and Yap (average score of .47).

Figure 2. Data specialists in Chuuk, Kosrae, and Pohnpei rated the prerequisites of quality aspect of their education management information system as established

Rating of prerequisites of quality aspect

| | Latent .00–.30 | Emerging .31–.59 | Established .60–.79 | Mature .80–1.00 |

Source: Authors' calculations based on participant responses during focus group sessions in each state in 2014.

Figure 3. Data specialists in Kosrae and Pohnpei rated the integrity of education statistics aspect of their state's education management information system as established

Rating of integrity of education statistics aspect

Category	Range
Latent	.00–.30
Emerging	.31–.59
Established	.60–.79
Mature	.80–1.00

Source: Authors' calculations based on participant responses during focus group sessions in each state in 2014.

In three states the accuracy and reliability of education statistics aspect was rated the highest among the five aspects of quality

In Chuuk, Kosrae, and Yap the accuracy and reliability of education statistics aspect received the highest rating among all aspects of quality.

Data specialists in each state rated the accuracy and reliability of education statistics aspect as mature in Kosrae (average score of .83) and Yap (average score of .81), indicating that processes are not only in place, but also represent best practices (figure 4). Data specialists in each state rated the aspect as established in Chuuk (average score of .65) and Pohnpei (average rating of .64).

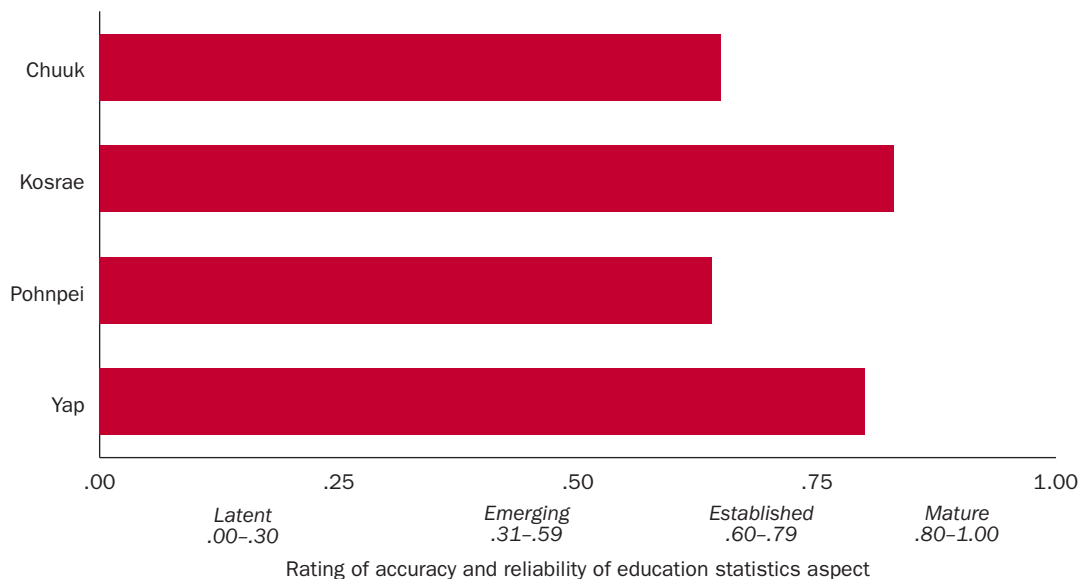### In three states the serviceability aspect was rated as established

The serviceability aspect was the highest rated aspect in Pohnpei, with an average score of 0.74, which falls into the established category and means that associated processes are in place and meet standards (figure 5). It was the second highest rated aspect in Yap, also with an average score of 0.74, after the accuracy and reliability of education statistics aspect.

Data specialists in Kosrae also rated the serviceability aspect as established (average score of .72). However, data specialists in Chuuk rated the aspect as emerging (average score of .56), indicating that the associated processes are in progress but not yet established.

In three states the accessibility of education statistics aspect was rated as established
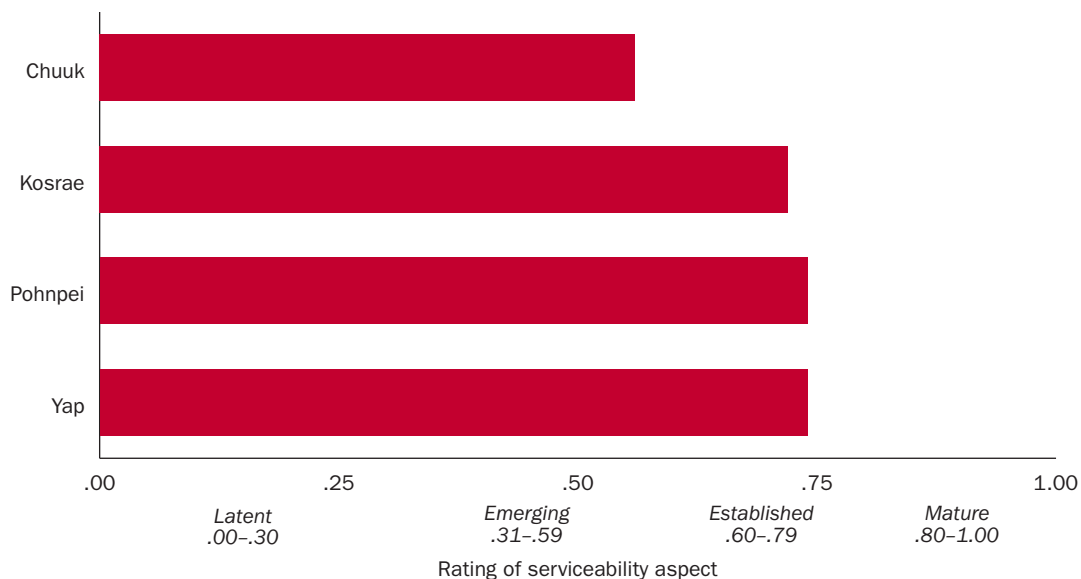
Data specialists in each state scored the accessibility of education statistics aspect as established in Kosrae (average score of .67), Pohnpei (average score of .65), and Yap (average score of .63), indicating that the associated processes are in place and meet standards (figure 6). Data specialists in Chuuk rated the accessibility aspect as emerging (average score of .48), indicating that the associated processes are in progress but not yet established.

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Figure 4. Data specialists in Chuuk, Kosrae, and Yap rated the accuracy and reliability of education statistics aspect as the highest among all aspects of quality of their state's education management information system


Rating of accuracy and reliability of education statistics aspect

Latent	Emerging	Established	Mature
.00–.30	.31–.59	.60–.79	.80–1.00

Figure 5. Data specialists in all four states rated the serviceability aspect as among the highest aspects of quality of their state's education management information system

Rating of serviceability aspect

Latent	Emerging	Established	Mature
.00–.30	.31–.59	.60–.79	.80–1.00

Figure 6. Data specialists in Kosrae, Pohnpei, and Yap rated the accessibility aspect of their state's education management information system as established
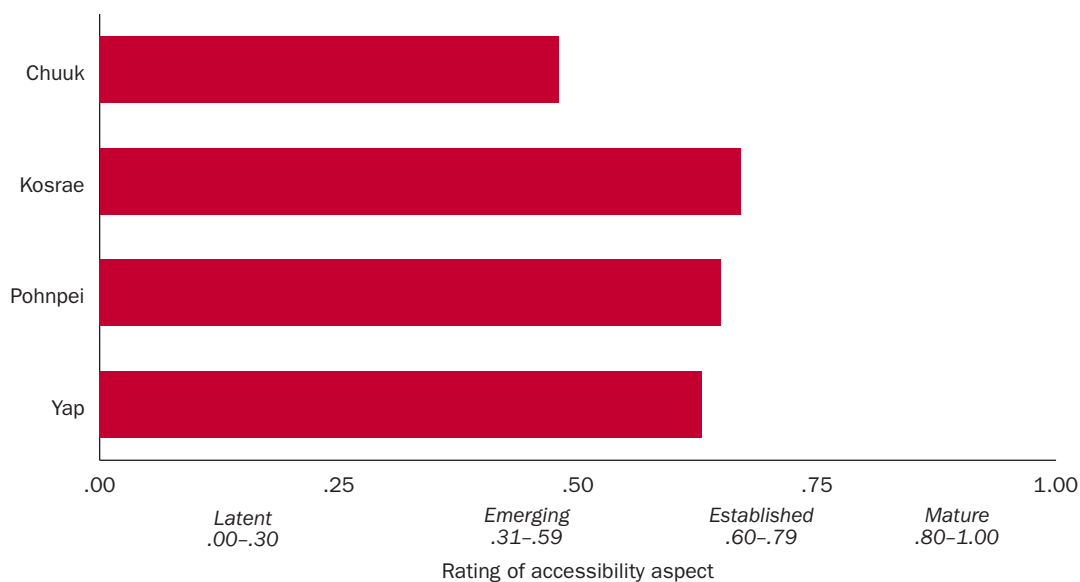
Source: Authors' calculations based on participant responses during focus group sessions in each state in 2014.

Implications of the study findings

This study provides an opportunity for Federated States of Micronesia data teams to consider the strengths and areas for improvement in each state's EMIS and to explore how the strengths of individual systems can be mirrored in those of the other states. A closer look at a state's EMIS may help in streamlining data collection, monitoring, and reporting for current policy-level priorities in the Federated States of Micronesia, such as strengthening the networking, delivery, and reporting of data (FSM Association of Chief State School Officers, 2009). And by focusing on lower rated areas of each quality aspect, data specialists may find opportunities to strengthen the value, accessibility, and timeliness of the data and statistics they provide to their stakeholders.

Overall

Each state differed, sometimes considerably, in the overall and aspect ratings of their EMIS, which may be explained in part by contextual diversity and differing resources across the states. Still, there are clear commonalities among the states, such as the view that data catalogs are not readily available. These shared concerns may provide the basis for collaboration among the Federated States of Micronesia national and state departments of education to begin exploring feasible and timely solutions in some of the areas for improvement identified in this report.

In addition, closer review of the findings across the states may inform larger policy conversations and strategic directions for education reform in the Federated States of Micronesia. For example, one of the five strategic education goals for the Federated States of Micronesia is to "ensure [a] consistent national performance-based monitoring and data-based decision-making system" (Federated States of Micronesia, 2015, p. 2). As of the 2015 Federated States of Micronesia Education Summit, this goal was organized into three strategies: data management policies at both the national and state levels, alignment of Federated States

of Micronesia performance standards with international standards, and connections between the national and state systems (Federated States of Micronesia, 2015).

With these strategies in mind, data teams in the Federated States of Micronesia may wish to consider some of the discrepancies between broader international standards and the current setup of their national and state EMISs. Although this study did not explicitly examine comparisons with international standards, referring to the SABER EMIS protocol may be useful in identifying key sources for international benchmarking of education management information systems (for example, the United Nations Educational, Scientific and Cultural Organization Institute of Statistics or International Standard Classification of Education).

Prerequisites of quality

Data specialists in Chuuk, Kosrae, and Pohnpei rated the prerequisites of quality aspect as established, while data specialists in Yap rated it as emerging. Ratings were not higher typically because data specialists noted a lack of clear lines of responsibility for collecting, processing, and disseminating statistics (rated as emerging or latent in all four states) and a lack of a clear legal mandate to ensure that individuals provide responses to statistical or survey questions (rated as emerging or latent in Chuuk, Pohnpei, and Yap). Powell and Trucano (2006) suggest that if clearer roles and responsibilities are established so data specialists receive the data they require, the health of the EMIS will improve. A clear legal authority to collect data is identified as a prerequisite of quality. Data specialists may wish to investigate whether lack of such authority impedes the attempt to gather information for analysis and reporting.

Integrity of education statistics

Data specialists in Kosrae and Pohnpei rated the integrity of education statistics aspect as established, while data specialists in Chuuk and Yap rated it as emerging. At the indicator level, ratings suggest that the systems may not adequately inform the public of the terms and conditions for collecting, processing, and disseminating statistics; that impartiality of statistics is not consistently guaranteed; and that public awareness of government access to unpublished statistics is not widespread. As noted by the World Bank (2011), integrity is considered crucial to ensuring that the general public can trust education data and can trust that such data are not swayed or influenced by political forces. Implementing a formal process for raising public awareness of statistical processes and procedures may increase transparency, public trust, and common understanding regarding this aspect of EMISs.

Accuracy and reliability

Data specialists in all four states rated the accuracy and reliability of education statistics aspect as either mature or established. However, data specialists in two states rated one indicator under this aspect as emerging, suggesting that improvements could be made in the regular review of data sources, correction of errors, and publication of corrections. Otherwise, the high ratings for this aspect across states suggest that ensuring accuracy and reliability is one of the strengths of the EMISs in the states of the Federated States of Micronesia, as data specialists generally know the sound techniques necessary to validate data and generate statistical reports, and source data are considered compatible with the expectations and requirements of the education system. This aspect also considers the data services provided for their timeliness, which supports policy planning and policy evaluation by ensuring the relevance of education statistics. Data specialists rated timeliness highly in Kosrae, Pohnpei, and Yap, so further examination of processes and solutions used in these states may help data specialists in Chuuk ensure that they receive data from source providers in a timely fashion.

Serviceability

Data specialists in Kosrae, Pohnpei, and Yap rated the serviceability aspect as established, while data specialists in Chuuk rated it as emerging. One particular area warranting attention are the processes for recommending revisions to provisional estimates, methods, and outputs and for ensuring that revisions follow a regular, well-established, and transparent schedule. Yap was the only state where data specialists assigned a mature rating to this indicator—data specialists in the other states rated it as emerging or latent —suggesting that this may represent an opportunity for exploring how the practices or processes in place in one state may be replicated across the states of the Federated States of Micronesia. Additionally, periodic training may be helpful in ensuring not only the consistency of statistics, but also their ability to be reconciled over time. While data specialists in Chuuk and Pohnpei rated the indicator of consistency and ability to reconcile statistics as established, data specialists in Kosrae and Yap rated it as emerging, suggesting that there may be value in such training to help increase consistency in how data are collected and compared over time.

Accessibility

Data specialists in Kosrae, Pohnpei, and Yap rated the accessibility aspect as established, while data specialists in Chuuk rated it as emerging. However, data specialists in all four states rated the availability of catalogs (including publications and other services) as an area that needed improvement. Data managers in the Federated States of Micronesia national and state departments of education may wish to refer to examples of internal catalogs or public documentation provided in other Pacific entities in order to apply any lessons learned as they implement improvements to their own EMISs.

Limitations of the studies

These studies have six main limitations.

First, no formal, standardized process was used to ensure the consistency of ratings across states. While the study team did provide a common protocol with focusing questions and helped clarify the meaning of every quality aspect, each state included a different set of participants, and there was no formal calibration of raters across states. So score comparisons across the four states may not reflect exact agreement on how ratings were assigned to individual indicators and thus how entire aspects of quality were rated.

Second, the protocol used in all states depended on the cooperation of the respective representatives of the state department of education and the insights of data specialists and department officials. Documentation of the EMIS (and the education system as a whole) is not formally cataloged and is rarely publicly available, which limits accessibility and independent review. The study team was limited to the documentation and evidence provided in the focus groups by data specialists to support their scores for the indicators.

Third, the relatively small number of data specialists in each focus group session might be considered a limitation; however, the data management function in each state department of education is supported by a very small team, and all management positions related to data collection, analysis, reporting, and dissemination for the departments' agencies were represented in the focus groups.

Fourth, as a qualitative protocol the assessment of many indicators relied heavily on self-reported perceptions and opinions of officials and data specialists in the state department of education, though the study team logged the responses of the data specialists and worked with them to identify the supporting documentation referenced during the focus group sessions. The focus group format provided an opportunity for

the data specialists to learn about one another's perceptions and viewpoints and to review any materials their colleagues offered in support of a score, but it is unknown what impact peer pressure might have had on participant responses.

Fifth, the psychometric properties of the SABER EMIS Assessment Tool are unknown, although World Bank researchers have indicated positive results for consistency across assessors and participants in six island nations in the Caribbean (World Bank, 2011). But the specific inter-rater reliability measures from this study are unknown. A study using the same assessment framework at the Federated States of Micronesia National Department of Education showed consistency in scores across focus group participants (Cicchinelli & Spencer, 2014). The tool is designed to promote discussions among those engaged in the daily work of operating the state EMIS as they consider its value and the quality of various system aspects and then document the various viewpoints and perceptions using quantitative scoring scales. Because scores reflect the perspectives of the individuals interviewed, they are not an objective view of system quality.

Sixth, respondents might have offered biased responses because they worked with different parts of their state EMISs and were therefore more familiar with some system issues than with others. The focus group format and the use of a transparent protocol were designed to mitigate individual biases. But the focus group format itself has the potential for biasing responses because individual confidentiality cannot be guaranteed, especially in a small group.

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