

Federated States of Micronesia
Education Sector

Education Management Information System
(FSM EDMIS)

Report and recommendations of Workshop



February 21 – 25, 2005
Skylite Hotel, Pohnpei State

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<p style="text-align: center;">FSM Education Management Information System (FSM EDMIS) Report and recommendations of Workshop February 21 – 25, 2005 Skylite Hotel, Pohnpei State</p>

Introduction

The FSM Education Sector is developing the national capacity to improve monitoring and reporting on the status of the education system. A number of factors are driving this development:

- The requirement to report by July 31, 2005 and yearly thereafter on Education Indicators to JEMCO for their consideration in yearly approval of grant awards,
- The need to improve tracking of education progress in the FSM, and
- To provide an improved database of information for data driven decision making in the FSM.

To assist in this development a nationwide workshop was convened the week of February 21 – 25, 2005 in Pohnpei State at the Skylite Hotel. Representatives of national and state departments of education were present (listing of participants attached in the appendix).

A series of descriptors were developed in the workshop to assist in guiding the development of the FSM EMIS and the underlying database, data collection and reporting system. The descriptors are as follows:

- Transparent and understandable for all stakeholders,
- Efficient in use,
- Accurate in the data provided and analysis of the data,
- Reliable,
- Consistent across the FSM Education Sector with common formats and coding of information,
- User Friendly both for stakeholders and for data managers,
- Accessible to all stakeholders,
- Effective in producing information in an understandable format,
- Productive as new situations arise and new data and information and analysis is required, and
- Responsive to the needs of data managers and data users for standard data and new data and analysis as conditions change.

Of particular importance are the common format and common coding of information that will allow the information to be compiled on a national scale. To meet reporting requirements at the national level all data from the states must be submitted in the agreed upon common format and using the common coding. Data in different formats and coding will need to be returned to the States for data cleaning.

Much of the background for the FSM EMIS Workshop was provided through materials from a UNESCO Workshop for Data Managers held in Apia, Samoa the first part of February 2005 and attended by National Division of Education Staff.

Education indicators:

A major part of the workshop was dealt with the concept of education indicators, what are they, what are the characteristics of a good indicator, what is the purpose of education indicators and what is the role of education indicators for strategic planning and the role of data managers. The following is a summary of information provided and discussed in the workshop.

What is an Education Indicator?

- composite index obtained from complex calculations performed to amalgamate information,
- should describe and highlight some of the features of the system, sometimes using a single category of raw data sometimes using processed data,
- a tool that should make it possible to have a sense of the state of an education system, and also to report on that state to the whole of the education community...to the whole country... It is information processed, so as to permit the study of an educational phenomenon (Sauvageot (1997: 16).
- a statistic that tells something about the performance or health of the education system.
- provide information about the health of a system, the indicator must have a reference point, or some other measure or standard against which it can be judged.
- Indicators must meet certain substantive and technical standards that define the kind of information they should provide and features they should measure.

Characteristics of a good indicator may be outlined as follows:

- its relevance: that is, suited to the measurement of the phenomenon being studied;
- its ability to summarize information without distortions;
- its precision and comparability;
- its reliability: that is good quality, from collection to compilation, of the basic data needed to calculate the indicator;
- regularly updated
- In order to construct a good indicator, one has to be able to identify the most interesting phenomena to measure, which will depend on the countries choice, as inspired by the objectives of its education policy.
- For example, the enrolment rate (net enrolment and gross enrolment) in primary education is a good indicator. But when a country has a full school attendance, it loses much of its importance

Purpose of an Education Indicator

- describe the education system's performance with respect to the achievement of the desired conditions and outcome,
- provide information about conditions or features that should be obtained if progress towards the achievement of the desired outcomes is to be made, i.e. they should enable decision-makers to predict the likely consequences of changes,
- measure how far or how close one is from an objective/ goal;
- identify problematic or unacceptable situations;
- meet policy concerns, and to answer questions leading to its choice;
- compare its value to a reference value and they should enable comparisons to be made among regions, districts, and other settings; types of schools, etc.;
- to aid decision-making

Indicators and Strategic Planning

To monitor the effectiveness of plans and strategies for development indicators need to be able to answer the following questions:

- Are targets being met?
- Are interventions working
- Have standards improved?
- Are resources being allocated effectively?
- Are resources being used efficiently?

You as data managers should be involved in the planning process

- computation of indicators
- monitor progress
- writing policy papers on trends based on data analyzed

Data collection and systems

Data collections and data collection forms were discussed and samples were given of both the PEDMS collection forms and various South Pacific countries data forms for review and discussion.

Some general guidelines were given for data collections forms:

- Simple, uncluttered
- Explains what the form is, who wants it filled in and why
- If you need help – it gives instructions
- What to do with the form when it is filled in
- Gives a clear return date

The issue of data accuracy and data cleaning were also addressed. To be useful, data must be accurate. Systems need to be in place to ensure that accuracy. Data cleaning is

ensuring that data is in a common format and obvious mistakes are corrected. Data cleaning needs to be done as close as possible to the source generating the data.

Current data systems

Currently State Department of Education data systems are primarily based on the Pacific Education Data Management System (PEDMS) that was developed through assistance from the Pacific Resources for Education and Learning (PREL) organization as part of the Freely Associated States Educational Grant (FASE) program (U.S. federal education program). The PDEMS is primarily based on the MS Excel program. Technical assistance, training and support have been provided by PREL using funds provided by the U.S. Department of Education.

As the FASE program is being consolidated in the Compact's Supplemental Education Grant (SEG) program, PREL will no longer be able to provide free technical assistance to support the PDEMS. Additionally, as PDEMS is in MS Excel (a spreadsheet) the capacity to make structural changes to the program is with technical experts at PREL (primarily Dr. Kyaw Soe, Ph.D.). In recent discussions, Dr. Soe has recommended porting the PDEMS data to MS Access (a database program) and eventually moving to a web based data system in the FSM.

The Special Education Programs in the FSM also are operating databases to allow reporting to the U.S. Department of Education (funding agency).

The FSM is also responsible for reporting key education data to UNESCO and other international organizations primarily in relation to the Education for All (EFA) and Millennium Development Goals (MDG). Often the ability of the National Government to report on education data has been hampered by the lack of data from the states and by the differences in data collected by the FSM states based on the U.S. data system and that data collected by a small island developing nation and reported in international forums.

The use of MS Access will allow greater control over the FSM EMIS to lie with technical staff in the FSM. Both states and national data managers will be able to develop new applications, make queries and generate reports as required for reporting and decision making. The use of MS Access can also allow data tables to be developed specifically for reporting on national education indicators while giving states the flexibility to add in state specific components depending on the local needs of the state.

A number of factors are affecting the data systems in the FSM. A key element is data quality. The attributes of quality data are: Timely, Accurate and Relevant. Communications and transportation problems affect data quality. Yap has developed a radio based system for electronic communications with its schools and Pohnpei is in the process of developing such a system. Other factors affecting data and data systems are cultural traits regarding dissemination of data and information that often hinder the free exchange of data even within a department of education.

A major weakness of current FSM Data Systems is the lack of 1) analysis of data and 2) use of data and analysis for decision making. Increasing the capacity of the FSM data managers for analysis and reporting and the ability of policy makers to effectively use data for decision making are high priorities.

Much but not all of the data to generate the JEMCO Education Indicators is being collected by the states. However, not all data is being collected nor are common coding and common formats being followed.

Approach of the FSM EMIS Workshop

The approach of the FSM EMIS Workshop was based on the active participation of the states in discussion and decisions on how a national EMIS system would be developed and maintained.

The JEMCO Education Indicators were discussed by the States at the Pacific Education Conference (PEC) in Rota in 2004 and agreed upon by JEMCO in August 2004. There was little involvement of the National Education Office in their formulation. A key part of the workshop was to deal with the concept of education indicators, what are they, what are the characteristics of a good indicator, what is the purpose of education indicators and what is the role of education indicators for strategic planning and the role of data managers.

A key issue was how education indicators link to overall goals of the FSM Education Sector and how those indicators can be used to improve the education system. Emphasis was also given to how data is collected, how it is compiled and analyzed, and how it is reported and used for decision making. A major agreement was that increased analysis and reporting of data is needed across the education sector. Currently limited analysis and reporting is occurring with a resulting lack of data driven decision making.

All presentations and documents (including the documents provided as part of the UNESCO Workshop for Data Managers) were provided to each state delegation on CD. Additional copies of the CDs can be obtained from the FSM National Division of Education.

Capacity development

The need for capacity development both in terms of human resources and systems was discussed and a listing of general needs was generated. The NDOE is committed to provide technical assistance and training for the FSM EMIS System using MS Access. The NDOE will not be able to provide support for the PEDMS in its MS Excel format.

1. Technical training to establish a comprehensive EMIS database system (long and short term)
 - a. Capacity to report on state and national level
 - b. Capacity for improved:

- i. Data collection
 - ii. Data compilation and analysis
 - iii. Reporting and data driven decision making
- 2. Training on MS Access Database
 - a. Operation of the FSM EMIS Database
 - b. Ability to incorporate state specific needs into database
 - c. Ability to independently query and report on the database
 - d. Porting of data from and between spreadsheet and other database programs
- 3. Develop EMIS as a career (institutionalization for departments) – work with National and State Leadership to ensure adequate human and financial resources devoted to EMIS
- 4. Training on networking and web based data systems
- 5. Improve equipment and communications capacity
- 6. NDOE initiative to contact FSM Telecom to expand bandwidth to allow greater access – outer islands telecommunications and Internet access +
- 7. Regular updates via email on workshops and progress in data system development and operation
- 8. Barriers: Lack of data collected from Schools
 - a. Pohnpei planning to network schools for data entry at school level
 - b. Yap already far along in process of networking schools

Agreements and next steps

The workshop generated a series of agreements and associated action steps on the last day of the workshop. In general, the FSM EMIS will be based on a MS Access database and a companion data collection format will be generated to assist with data collection. Technical support will be provided for the FSM EMIS MS Access system but not for other systems the states may choose to use. States must submit the agreed upon data in the common format agreed upon and using the common coding.

The following actions steps are generated to support the agreed upon strategies for developing the FSM EMIS.

- 1. Write up of indicators as part of a comprehensive report of the FSM EMIS Workshop – background, calculations and analysis
 - a. Distribute draft to workshop participants via email (deadline for emailing 3/7/2005)
 - b. Please comment within 3 working days and get comments from others in your department
 - c. Write up will be sent to SHESA, Directors and OIA for comments and approval
- 2. Develop data collection packet based on write up of indicators
 - a. Same process as above
- 3. Develop FSM EMIS database in MS Access

- a. Distribute copies to states (because of the size of databases may need to be sent on CD, etc.)
4. Start data collection and calculation, analysis on selected indicators in March 2005 and as other data becomes available
5. Report to FSM Education stakeholders and JEMCO on FSM Education Indicators in July/August 2005 and yearly thereafter.
6. Research and move toward a web based FSM EMIS in 2006 for national compilation of data.

FSM Education Indicators

The following section is designed to take individual education indicators and provide understanding of what the indicator is measuring, what data needs to be collected, how the data will be reported and problems that may arise in the data collection, analysis or reporting stages.

As reported above a concern of the workshop was that many of the indicators are quantitative and not qualitative in nature. To make the indicators more useable for decision making and to present a more comprehensive understanding of the FSM Education System data and reporting on the indicator may be desegregated into a number of different categories. For examples, per pupil expenditures will be reported as a department total, per pupil for various funding streams and as a breakdown by budget categories to show the differences by state for each funding stream, which funding stream pays for what and the per cent of personnel in the regular program. It is felt that taken together, the desegregated data provides a better understanding of per pupil expenses than a single department figure.

1. Number of schools by grade level (i.e., elementary, middle/junior, and high school)
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This is a basic indicator of schools and will not change dramatically from year to year, but only as new schools are opened and existing schools are closed or merged.

Additional ways to present the indicator to make it more valuable for decision making:

- By school type: (public/private) & (regular, vocational, special education, early childhood, and other)
- Location by region and island with a special breakout for outer islands

Recommended data fields to support this indicator include:

- School code (to be developed as a common coding pattern across the FSM)
- State (pull down menu)
- Name of School
- Location 1 (region) (pull down menu)
- Location 2 (island name) (pull down menu)
- Outer island (Y/N)
- Public/Private (pull down menu)

- Type of School (elementary, middle/junior, high) (pull down menu)
- Type of School 2 (vocational, special education center, early childhood center, etc.) (pull down menu)
- Grades served (pull down menu)
- Full time? (Y/N)

Issues

There is no common definition of what is elementary, middle/junior or high school. Generally, elementary includes grades 1 – 8, but Kosrae also has a grade 9. High school is generally 9 – 12 except in Kosrae where it is 10 – 12. A common coding pattern will be established for data entry.

Note that as the former Headstart program is being merged into the education systems, independent Early Childhood Centers should also be listed. All private school should be listed as well.

2. Number of schools by size (i.e., enrollment under 50, between 51-100, 101-200, 201-300 and over 300)

No special data is needed to be collected for this indicator as the school enrollment collected and reported for indicator #10 coupled with information from Indicator #1 will allow generation of this indicator.

Additional ways to present the indicator to make it more valuable for decision making:

- By school types
- By location (especially by outer island)

3. Number of schools operating half-day sessions

This indicator generated a great deal of discussion. Generally, by definition, all schools in the FSM operate full day sessions with only early childhood and lower elementary grades operating half day instruction.

The NDOE has been requested to contact the OIA Office in Honolulu to obtain greater detail on this indicator and what is will actually report.

4. Number of full-time staff and number of part-time staff

As shown by the requirements of the JEMCO required report on staffing patterns additional information is needed for adequate reporting including title, salary, Date of Birth, Date of Hire, etc.

Additional ways to present the indicator to make it more valuable for decision making:

- State

- Job Title
- Salary
- Gender
- Age
- Source of funding
- Location

Recommended data fields to support this indicator include (may be in more than one table):

- SS# (SS# will be the primary tracking number for all staff)
- State (pull down menu)
- FirstName
- LastName
- Job Title (Common code needed) (pull down menu)
- Organization (pull down menu)
- DOB
- DOH (date of hire)
- Gender
- Salary
- Benefits
- Source of funding (common code needed) (pull down menu)
- Full time/Part time
- Location (where name of school or office)

5. Number & percent of staff by education level (i.e., high school diploma, AA/AS, BA/BS, etc.)

The data to track and report on this indicator also needs to include colleges attended and date of graduation. Additionally for FSM needs, this indicate will also need to track the FSM Teacher Certification System.

Additional ways to present the indicator to make it more valuable for decision making:

- State
- Job Title
- Salary
- Gender
- Age
- Source of funding
- Location
- Certification level
- Major/minor

Recommended data fields to support this indicator include:

SS# Name of College (school) attended (Common codes needed across the FSM) Major (pull down menu) Minor (pull down menu) Degree? (Y/N) Type of Degree (pull down menu) Year of Degree	SS# FSM Certification (Y/N) Type of Certification (pull down menu) Expiration Date
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6. Number of teachers/staff by grade level

An agreement will need to be made on what is a teacher and what is staff. Issues such as how to classify a principal who spends at least 50% of time substituting, etc. will need to be addressed and a common format and coding are established as part of the data collection form.

Additional ways to present the indicator to make it more valuable for decision making:

- Public/Private
- Outer island vs. State Center
- Type of school
- Education level

Recommended data fields to support this indicator include:

- SS#
- School Year (pull down menu)
- Location
- Grade (s) (pull down menu)
- Subject (s) (pull down menu)

7. Student-to-teacher ratio

Student to teacher ratios are fairly straight forward however, there are a number of issues that need to be addressed. Included are what about teachers assistance or special education teachers who do not teach a specific grade.

Additional ways to present the indicator to make it more valuable for decision making:

- State
- Location (region or outer island)
- Public/Private
- Elementary vs. Secondary
- Secondary: Academic vs. Vocational

Data to generate this indicator is obtained in data from indicator #6 and #10.

8. Base populations by school age groups (i.e., total no. of 4-5 yr. olds, 6-13 yr. olds & 14-18 yr. olds)

This data is not generally tracked by Education, but is the domain of the national statistics office and the census bureau. The census is normally only taken at 10 year periods. There are statistical methods that are used calculate these figures and project the age groups on a yearly basis. The NDOE has been directed to contact the National Statistics Office to determine is the there is local capacity to perform these calculations. If no local capacity is present, external experts may need to be contracted.

The high level of out migration of FSM citizens to the U.S. is also a factor in this calculation. It is estimated that up to ¼ of FSM citizens are in the U.S. To the best of our knowledge we do not know what per cent of school age children this represents. FSM Immigration has only recently started tracking FSM citizens leaving the FSM.

9. Percent of base school-age population in school by age groups (e.g., % of 4-5 yr. olds actually enrolled)

Information on this indicator is not generally being tracked across the FSM. There are two ways to handle the data. States are moving toward tracking individual students and that data would include DOB. Second would be for the data collection to directly indicate age as enrollment by grade and gender being tracked in #10 would also include age.

This data is not generally tracked by Education, but is the domain of the national statistics office and the census bureau. The census is normally only taken at 10 year periods. There are statistical methods that are used calculate these figures and project the age groups on a yearly basis. The NDOE has been directed to contact the National Statistics Office to determine is the there is local capacity to perform these calculations. If no local capacity is present, external experts may need to be contracted.

This indicator may be difficult to report on a national scale in 2005 as age is not being tracked in all states.

To calculate this ratio the Gross Enrollment Ration (GER) formula will be used. Consideration should also be given to the need for Net Enrollment Ratio and other coverage formula as described in the appendix on Mathematical Calculations.

$$\text{GER (\%)} = \frac{\text{No. of students enrolled in a cycle regardless of age}}{\text{Population of official age for this cycle}} \times 100$$

10. Student enrollment by grade level and gender

This is a fairly straightforward indicator to obtain and calculate. However, the age of students may be to be included to assist in calculation of education indicator #9.

Additional ways to present the indicator to make it more valuable for decision making:

- State
- Location (region)
- Public/Private

Recommended data fields to support this indicator include:

- School code
- School Year (pull down menu)
- Grades listed separately
 - Male
 - Female
- Age?

11. Average daily student attendance rate by grade level and gender

This indicator generated a great deal of discussion. A number of factors are present. Do we also need data on teacher attendance? How about the reason for absent? How do we count secondary – by first period/homeroom or by individual classes? Data has to be collected daily, but when is it sent for compilation – daily, weekly, quarterly, etc.? Transportation will hamper the collection of this data, especially in the outer island of Chuuk and Pohnpei.

A second major area of concern was the sheer magnitude of the data collection and compilation. This indicator is best done when the schools are entering the data directly into a database.

Additional ways to present the indicator to make it more valuable for decision making:

- State
- Location (region)
- Public/Private

Recommended data fields to support this indicator include:

- School code
- School Year (pull down menu)
- Attendance for students by Grades listed separately
 - Male
 - Female
- Attendance by teachers
 - Male
 - Female

12. Drop-out rate by grade level and gender

This indicator while it appears simple also generated a great deal of discussion. Concern was raised over the definition of drop-out and the need for retention and transfer rates. In the absence of mechanisms for tracking individual students issues such as out migration to the U.S., transfer outer island to main island schools, student expelled or out of school for academic reasons entering a private schools, etc. all were addressed. Concern was also addressed over the need for tracking of the reason for dropping out of school.

Drop-outs are considered to be students to drop-out of school and do not enter another school either public or private.

Drop-out and transfer rates are recommended to be tracked quarterly with retention rates reported yearly in the forth quarter report.

Recommended data fields to support this indicator include:

- School code
- Drop-out by grade and gender
- Transfer by grade and gender
- Retention (repeaters) by grade and gender

Calculations

$$\text{Drop-out rate} = \frac{\text{No. of students dropping out from Grade } g \text{ in year } t}{\text{Total No. of pupils in Grade } g \text{ in year } t} \times 100$$

$$\text{Retention rate} = \frac{\text{No. of repeaters in Grade } g \text{ in year } t + 1}{\text{Total No. of pupils in Grade } g \text{ in year } t} \times 100$$

Please see the section in the appendix on Mathematical Calculations for greater discussion on efficiency measures for an education system.

13. Number and percent of students achieving “Proficiency” level & above, at selected grade levels for standardized tests (e.g., SAT 9) or criterion-referenced tests (e.g., locally developed tests)

Data collection and reporting are recommended on the FSM National Standardized Test (NST) and the College of Micronesia-FSM Entrance tests. These are the only the only standardized tests administered across all states. SAT 9 is no longer administered as it provided little useful information.

NST will be reported by gender, grade (6, 8 & 10 – with a 3rd grade Mathematics Test currently under development) at the School, State and National levels and the COM-FSM entrance will report on graduating seniors by School, State, and National levels by gender.

States will also report on high school entrance tests by school and gender.

14. Completion/graduation rate for 8th and 12th grades

After discussion it was agreed that completion and graduation rates will be reported by gender using cohort division (number of students entering 1st grade for 8th grade grading rates and number of graduating senior divided by both the number of entering freshmen and the cohort data.

An end of school data collection form will be used to calculate the rates.

15. Number and percent of grade 8 completers going to high school and high school graduates going to higher education

A number of factors affect the 8th grade component of the indicator. Not all students graduating from 8th grade go on to high school. Some states have special programs for this group of students and some states allow students to repeat the 8th grade to increase their ability to pass the high school entrance test.

At the 12th grade additional factors also come into play. We can track the students who enter COM-FSM, but lack some control over the data for students who are going abroad for either work or higher education. To day data must be collected from scholarship applications, but not all students apply for state scholarships. PELL Grant does not track students by FSM.

Two different types of calculations may also apply. One is division by the number of students in a cohort – that is number of graduates divided by the total number of children entering into the 1st grade. A second approach is use the number of students entering into the eight grades.

Calculations using both sets of data will be used.

16. Number of student textbooks by subject areas and grade level

In addition to the number of textbooks, consideration should be given to reporting the data as textbooks per student.

Recommended data fields to support this indicator include:

- School code
- Number of student enrolled by grade level
- Subject taught at each grade level
- Name of textbooks (all subject areas to be captured)
- Number of textbooks

- Cost of individual textbook (starting with newly purchased texts)
- Name of publisher
- Condition
- Date purchased

17. Per pupil expenditure (annual operating k-12 budget divided by enrolled student count)
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This is a straight forward calculation, however, it has been recommended to provide the data in a number of different ways to provide a better picture of per pupil expenditures.

Desegregate data by:

- Funding source (regular, SEG, Federal Programs, Local Revenue, Other sources)
- Elementary vs. Secondary
- Per pupil for textbooks
- Per pupil for supplies
- % of budget by object class

To calculate the indicator, data from student enrollment indicator #10 will be used and a spreadsheet of all funding sources broken down by object classes.

18. Number of parent involvement activities per year by school and average number of parents participating
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By parent involvement this indicator is considered to mean formal meeting such as PTA, clean up, graduations, etc. and not individual parent interactions with teachers.

Recommended data fields to support this indicator include:

- School code
- Number of meetings per year by school
- Type of meetings
- Type of school activities
- Number of participants (sign up sheets with summary)
- Average number of participants

Discussion was also held on how often to report this indicator. The recommendation is to report the indicator quarterly while compilation will be yearly.

This indicator may be difficult to report in 2005 as data was not uniformly obtained across the states.

19. Student enrollment in local institutions of higher education (IHE)

Data for this indicator will be provided by COM-FSM. Data will be requested to be provided in the following format.

Recommended data fields to support this indicator include:

- Student enrollment by state and gender and campus
- Student majors by state, gender and campus
- Students in developmental (remedial) and college level courses
- Outside colleges same data (estimates)

20. Number of IHE graduates by each diploma/degree level

Data for this indicator will be provided by COM-FSM. Data will be requested to be provided in the following format.

Recommended data fields to support this indicator include:

- Number by degree or certificate type by gender, state, major/minor and campus

**FSM Management Information Systems (MIS) Workshop
Agenda
February 21 – 25, 2005
Skylite Hotel Pohnpei State**

Time	Monday, 2/21/05	Tuesday, 2/22/05	Wednesday, 2/23/05	Thursday, 2/24/05	Friday, 2/25/05
Morning	No session – rest for travelers arriving early Monday morning	*Education Indicators – What they are and how to develop them. (Presentations and breakout sessions)	*Additional FSM Education Indicators – (Breakout sessions)	*Technology and platforms (databases) for the FSM MIS (Presentation and Breakout sessions Pros and Cons)	* Data driven decision making (Presentation and Breakout Sessions) *Technical assistance and capacity development needs (Breakout sessions) *Action planning and timelines (Breakout sessions)
Afternoon	*Opening session at 1:30 PM *Welcoming and opening remarks *Overview of workshop objectives & agenda (Presentation) *The Data Cycle (Presentation) Review of current data systems - National and State Overviews (Presentations) *Framework for data systems in the FSM – options (Discussion)	*Education Indicators - JEMCO, EFA and other indicators (Presentations and breakout sessions) *FSM Education Status and Statistical Reports – What’s needed? JEMCO, Education Sector, PRISM, etc. (Breakout sessions)	*Data Entry and Systems (Presentation and Breakouts) *Data needs to report on FSM Education Indicators *FSM Data collection packet – design (Breakout sessions) *Data Systems and Barriers in the FSM (Breakout sessions)	*Data porting – Issues, concerns and procedures (Presentation and Breakout sessions)	*Action planning and timelines competed (Breakout sessions) *Closing

**Morning sessions will start at 9:00 AM (refreshments available at 8:30 AM) until noon with a 1 ½ lunch break.
Afternoon sessions are from 1:30 PM – 4:00 PM**

FSM JEMCO Education Indicators

Indicators of Educational Progress adopted August 11, 2004

1. Number of schools by grade level (i.e., elementary, middle/junior, and high school)
2. Number of schools by size (i.e., enrollment under 50, between 51-100, 101-200, 201-300 and over 300)
3. Number of schools operating half-day sessions
4. Number of full-time staff and number of part-time staff
5. Number & percent of staff by education level (i.e., high school diploma, AA/AS, BA/BS, etc.)
6. Number of teachers/staff by grade level
7. Student-to-teacher ratio
8. Base populations by school age groups (i.e., total no. of 4-5 yr. olds, 6-13 yr. olds & 14-18 yr. olds)
9. Percent of base school-age population in school by age groups (e.g., % of 4-5 yr. olds actually enrolled)
10. Student enrollment by grade level and gender
11. Average daily student attendance rate by grade level and gender
12. Drop-out rate by grade level and gender
13. Number and percent of students achieving “Proficiency” level & above, at selected grade levels for standardized tests (e.g., SAT 9) or criterion-referenced tests (e.g., locally developed tests)
14. Completion/graduation rate for 8th and 12th grades
15. Number and percent of grade 8 completers going to high school and high school graduates going to higher education
16. Number of student textbooks by subject areas and grade level
17. Per pupil expenditure (annual operating k-12 budget divided by enrolled student count)
18. Number of parent involvement activities per year by school and average number of parents participating
19. Student enrollment in local institutions of higher education (IHE)
20. Number of IHE graduates by each diploma/degree level

Must be reported on each year by July 31, 2005

Part II: Core EFA Indicators

- Indicator 1:** *Gross enrolment in early childhood development programmes, including public, private, and community programmes, expressed as a percentage of the official age-group concerned, if any, otherwise the age-group 3 to 5.*
- Indicator 2:** *Percentage of new entrants to primary grade 1 who have attended some form of organized early childhood development programme.*
- Indicator 3:** *Apparent (gross) intake rate: new entrants in primary grade 1 as a percentage of the population of official entry age.*
- Indicator 4:** *Net intake rate: new entrants to primary grade 1 who are of the official primary school-entrance age as a percentage of the corresponding population.*
- Indicator 5:** *Gross enrolment ratio.*
- Indicator 6:** *Net enrolment ratio.*
- Indicator 7:** *Public current expenditure on primary education a) as a percentage of GNP; and b) per pupil, as a percentage of GNP per capita.*
- Indicator 8:** *Public expenditure on primary education as a percentage of total public expenditure on education.*
- Indicator 9:** *Percentage of primary school teachers having the required academic qualifications.*
- Indicator 10:** *Percentage of primary school teachers who are certified to teach according to national standards.*
- Indicator 11:** *Pupil-teacher ratio.*
- Indicator 12:** *Repetition rates by grade.*
- Indicator 13:** *Survival rate to grade 5 (percentage of a pupil cohort actually reaching grade 5).*
- Indicator 14:** *Coefficient of efficiency (ideal number of pupil years needed for a cohort to complete the primary cycle, expressed as a percentage of the actual number of pupil-years).*
- Indicator 15:** *Percentage of pupils having reached at least grade 4 of primary schooling who master a set of nationally defined basic learning competencies.*
- Indicator 16:** *Literacy rate of 15-24 year olds.*
- Indicator 17:** *Adult literacy rate: percentage of the population aged 15+ that is literate.*
- Indicator 18:** *Literacy Gender Parity Index: ratio of female to male literacy rates.*

Mathematical Calculations

(Friday 4/01/05 pm and Monday 7/01/05 am)

Access and Coverage

	Access	Coverage
Conceptually	Focus on the starting point in a cycle	Focus on the entire duration in a cycle
Technically	Admission Transition	Enrolment

1.0 Access

Measuring access to education will help identify the percentage of children of a given school age who are able to gain access to a particular level or cycle of education.

1.1 Admission Rates

Access to the first level of education is measured in terms of the proportion of children admitted relative to the total child population eligible for enrolment at that level, and this measure is described as the admission rate.

Two rates commonly used for measuring admission; *the gross admission rate* and the *age-specific admission rate*.

What is a rate? It is a ratio expressed as a percentage. For example, 10% = 10/100 = 0.1

1.1.1 Gross Admission Rate (GAR)

This rate identifies the number of children newly admitted to the first year of school as a percentage of children who are entitled to admission.

$$\text{GAR (\%)} = \frac{\text{No. of new pupils in Grade 1}}{\text{Population of legal admission age}} \times 100$$

Legal age of admission refers to the age at which children are supposed to start school.

One of the problems with GAR is that it often produces an illusion of a high rate of admission when this is not really the case. GAR can be in excess of 100 per cent as Grade 1 pupils consist not only of children of legal age of admission, but also of children of different ages (younger and older than the legal admission age).

Exercise 1

In Country A there are 20,500 pupils in Grade 1 of primary school. Of these 3,897 are repeaters. If the total population legally entitled to gain admission to Grade 1 is 17,527, calculate the gross admission rate for the country.

1.1.2 Age-specific Admission Rate (ASAR)

The advantage of this rate is that it provides a clearer picture of how different age groups access to the first level of education. This is because it identifies the number of newly admitted children of a specific age as a percentage of the total number of children of the same age in the population.

$$\text{ASAR (\%)} = \frac{\text{No. of new pupils in Grade 1 of specific age}}{\text{Population of same specific age}} \times 100$$

Exercise 2

In Country B there are 9,211 six year olds and 20,138 seven year olds in Grade 1 of primary school. Of these 154 six year olds and 5,234 seven-year olds are known to be repeating the grade. If the total number of six and seven-year old in the population is 30,714 and 30,969 respectively, calculate the respective age-specific admission rates for six-year old and seven-year old children.

1.1.3 Net Admission Rate (NAR)

A special case of the age-specific admission rate is one where the net admission rate corresponds to the legal admission age that is the number of new pupils of the legal admission age is measured as a percentage of the total number of children of the same age group.

$$\text{NAR (\%)} = \frac{\text{No. of new pupils in Grade 1 of legal age}}{\text{Population of legal admission age}} \times 100$$

1.1.4 Transition Rate from Primary to Secondary Education

The *transition rate* calculates the number of new pupils entering a given level of education as a percentage of the pupils who were last year at the end of the previous level.

Planner needs to measure transition of pupils from one level to another under the prevailing conditions. For example, one might wish to calculate transition rates from primary to secondary education, from lower to upper secondary, or from secondary to higher education

$$\text{Transition Rate (\%)} = \frac{\text{No. of new pupils in Form 1 of secondary in year } t}{\text{No. of pupils in final grade of primary in year } t-1} \times 100$$

Exercise 3

In Country C there were 12,104 pupils in Form 1 of secondary education in 2004. Of these 1,803 were known to be repeating the grade. If the number of pupils in the final year of primary education in 2003 was 38,602 calculate the rate of transition from primary to secondary education for 2003.

2.0 Coverage

2.1 Enrolment Rates

Governments are concerned not only to provide sufficient places for pupils at the beginning of each educational level, but also to ensure that those who start studying in a particular cycle, pursue their studies as far as possible – ideally to the completion of the cycle.

Enrolment rates indicate the number of children enrolled in education as a proportion of the population of related school age. Three rates that are commonly used in measuring enrolment rates namely: *the gross enrolment rate, the net enrolment rate and the age-specific enrolment rate.*

2.1.1 Gross Enrolment Rate (GER)

The GER is the number of pupils in a given education cycle expressed as a percentage of ‘the population of related school age’. It ignores the ages of the children actually in that cycle. GER measures the capacity of the system to admit, in a given cycle, children of corresponding school age.

$$\text{GER (\%)} = \frac{\text{No. of students enrolled in a cycle regardless of age}}{\text{Population of official age for this cycle}} \times 100$$

Exercise 4

In Country D there were 125,541 pupils in Grades 1-6 of primary education in 2003. The legal age of admission was 7, and there were 147,473 children in the population aged 7-12. Calculate the gross enrolment rate for primary education in the country in 2003.

Exercise 5

Table 1 below records the enrolment in primary education in Country E by sex and place of residence in 2004 together with related population figures. Use the data provided to calculate separate gross enrolment rates for:

- (a) boys (b) girls (c) urban residents (d) rural residents

Table 1: Enrolment in primary education, together with related school age population figures (7-12), broken down by sex and place of residence, Country E, 2004.

<i>Enrolment</i>	<i>Population 7-12</i>
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	<i>Rural</i>	<i>Urban</i>	<i>Rural</i>	<i>Urban</i>
<i>Boys</i>	54 000	36 000	205 000	45 000
<i>Girls</i>	41 000	29 000	210 000	48 000

2.1.2 Net Enrolment Rate (NER)

The NER provide deeper insight into enrolment, the calculation takes into account the actual ages of pupils in school, depends on relevant age-related data available.

$$\text{NER (\%)} = \frac{\text{No. of pupils of official age enrolled in the cycle}}{\text{Population of official age for this cycle}} \times 100$$

Exercise 6

In Country F there were 243,593 pupils in Grades 1-6 of primary education in 2004. Of these 229,416 were in the 7-12 age groups. This can be compared with 291,791 children in the 7-12 age group in the population. Assuming that the legal age of admission to the first level of education was 7, use the information provided to calculate:

- (a) *the net enrolment*
- (b) *the gross enrolment*

2.1.3 Age-Specific Enrolment Rate (ASER)

Age-specific enrolment rate is not associated with any educational cycle. It places emphasis on the percentage of young people of a given age or age group enrolled in the education system, regardless of the level or cycle concerned.

$$\text{ASER (\%)} = \frac{\text{No. of students of age X enrolled in schools regardless of cycle}}{\text{Population of age X}} \times 100$$

Exercise 7

Of a total population of 43, 968 twelve year olds it was noted that there were 24,616 in primary education and 2,753 in lower secondary education in Country G in 2004. Assuming that the education system provided no other form of education for this age group, calculate the age specific enrolment rate for twelve-year olds in the country.

2.1.4 Percentage of Over-aged students

This indicator is to calculate the percentage of over-aged students in a cycle.

$$\% \text{ of over-aged students} = \frac{\text{No. of over-aged students in a cycle}}{\text{Total no. of student in the related cycle}} \times 100$$

*Why are there over-aged students in the cycle?
What are the implications on cost to the government and the parents?*

2.1.5 Percentage of students of non-official age

$$\% \text{ of students of non-official age} = \frac{\text{No. of students of non-official age in a cycle}}{\text{Total No. of students in the related cycle}} \times 100$$

*Why are there under-aged students in the cycle?
What are the implications on cost to the government and the parents?*

2.1.6 Percentage of pupils out of school

This indicator measures the percentage of students of official age in a cycle that are not attending school.

$$\% \text{ of pupils out of school} = \frac{(\text{Population of official age for a cycle}) - (\text{No. of students of official age in a cycle})}{\text{Population of official age in the related cycle}} \times 100$$

Limitations

- The indicator on access and coverage does not show the rate of going through the system;
- Calculation requires detailed demographic data (for example for different age);
- Certain type of data are not available regularly (example: census every 10 years)

Internal Efficiency

Efficiency

Optimal relationship between input and output. To achieve the objectives, an individual or organization has certain resources or *inputs* available and will seek to employ them in such a manner as to produce the desired *outputs* with minimum cost and effort.

Efficiency in education

- Educational output

External efficiency

Knowledge, skills, attitudes, passing the final exam, etc

Internal Efficiency

Maximum number of pupils who complete the cycle within the prescribed period

- Educational input (pupil-year)

Human resources (school heads, teachers, school staff, etc)

Material resources (textbooks, classroom equipment, school furniture, school building, etc)

Flow of pupils through the education system

In order to trace the flow of pupils through an education system, it is helpful to ask this question: What has happened to the pupils enrolled in a particular grade in the previous year?

Three possible and mutually exclusive things may have happened to them:

1. they may have been promoted to the next higher grade;
2. they may have repeated their grade;
3. they may have dropped out (i.e. no longer attend school, or have moved to another school system or have died).

Promotion rate + Repeater rate + Drop-out rate = 100%
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The flow of pupils can be measured by the following rates – promotion, repetition and dropouts.

Promotion Rate

$$\text{Promotion rate} = \frac{\text{No. of pupils promoted to Grade } g + 1 \text{ in year } t + 1}{\text{Total No. of pupils in Grade } g \text{ in year } t} \times 100$$

Repetition Rate

$$\text{Repetition rate} = \frac{\text{No. of repeaters in Grade } g \text{ in year } t + 1}{\text{Total No. of pupils in Grade } g \text{ in year } t} \times 100$$

Drop-out Rate

$$\text{Drop-out rate} = \frac{\text{No. of students dropping out from Grade } g \text{ in year } t}{\text{Total No. of pupils in Grade } g \text{ in year } t} \times 100$$

Exercise 8

Using the data in Table 2 below, calculate the yearly rates of promotion, repetition and dropout for boys in public primary education in 2003. Write answers in Table 3 below.

Table 2: Enrolment of boys in public primary education, Country H 2003-2004

	Year				
	1	2	3	4	5
2003					
Number enrolled	268 851	221 913	212 901	190 310	213 948
2004	282 613	236 346	223 807	207 332	235 120

Number enrolled

Of which repeaters from previous year

70 965 49 788 55 435 57 077 108 900

Note: In addition, it is recorded that the end of 2003, a total of 97 560 pupils graduated successfully at the end of year 5.

Table 3: Answers for Exercise 8

	Year				
	1	2	3	4	5
Promotion rate
Repetition rate
Drop-out rate

Cohort Analysis

- A group of persons who jointly experience a series of events over a period of time
- School cohort – a group of pupils who enter the first grade of a given cycle in the same school year and subsequently experience promotion, repetition, drop-out, or successful completion of the final grade.
- Cohort analysis traces the flow of a group of pupils who enter Grade 1 in the same year and progress through an entire educational cycle.

Exercise 9

Using the flow rates for promotion, repetition and dropout you calculated in Exercise 8 as your working data:

- draw a cohort flow diagram to correspond to the flow rates with only two repetitions are permitted;*
- calculate the resulting wastage ratio*
- calculate the survival rates for Grades 2, 3, 4 and 5.*

Wastage ratio

$$\text{Wastage ratio (WR)} = \frac{\text{Actual input/output ratio}}{\text{Ideal input/output ratio}}$$

where

$$\text{Actual input/output ratio} = \frac{\text{pupil-years going through the system}}{\text{successful "completers"}}$$

Survival rate

The survival rate enables an educational planner to know what proportions of the initial intake of the educational cycle will eventually reach Grades 2, 3, 4, ...and so on until the final grade.

The analysis of variations

Growth Rate (or percentage variation)

A growth rate is measured by calculating the relative variation of a quantity between one period and another (e.g. student enrolment from 1995 – 2000); this is done by relating absolute variation to its original value. For example the primary school enrolment in Country J was 800 in 2000 and 950 in 2004.

The absolute variation is $950 - 800 = 150$ pupils

The relative variation is $(950 - 800)/800 = 0.19$

The growth rate between 2000 and 2004 was 19%.

The average annual growth rate

The average growth rate r , applied each year, producing the same increase, is given by the formula:

$$r = \left(\sqrt[n]{\frac{X_n}{X_0}} - 1 \right) \times 100$$

where n is the number of years, X_0 the quantity in year 0, X_n the quantity in year n .

For example, if primary school enrolment increases from 800 in year 0 to 950 in year 5, the average annual growth rate would be:

$$r = \left(\sqrt[5]{\frac{950}{800}} - 1 \right) \times 100 = 3.5\%$$

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