**Objectives/ rationale**

- All these methodologies are existed long time ago
- Many also developed with different platforms and versions – UNESCO PROAP: Lotus model
- Decentralization process demands the analysis at all levels (central to local)
- Approach of planning shifts to static planning to dynamic planning
- Demand for efficient resource allocation

**Development platform**

- Microsoft Excel
  - Reasons
    - Almost of all the statistics sections in the ministries in the Asia use Microsoft Excel
    - Do not require the additional development tool (already build-in)
    - Training on how to use Excel can be widely available in the countries. A lot of materials, schools, experts...
    - UNESCO training can be focused on substantive rather than technical
    - Smaller file size

**Development modality**

- Easy and simple to use (users rather than experts)
- Widely available software platform (training, cost of installation, standardization)
- Easy to upgrade and modify
- Modular approach
- No hassle about installation and should be self-contained
- Training can be self learning to a specific training course

**Its components**

- *Sprague Multipliers* provides a tool to estimate the population by single year of age
- *Cohort Analysis* offers for planners to assist them with calculating student flow rates and measuring internal efficiency
- *Enrolment Projections* provides a tool for projecting enrolment, personnel requirements (teaching and non-teaching staff), recurrent costs (salaries and allowances) and fixed costs (construction and others) needed to reach plan targets within a given plan period.
- *Gini Coefficient* measures disparities which can be useful to illustrate, inequalities in the distribution of enrolment.
Additional functions

- **Paste Value**: Allows you to paste the values that you have copied from other cells into new cells.
- **Paste Transpose**: Allows you to paste the values of a vertical range of cells as a horizontal range or vice versa.
- **Linear Interpolation**: Makes linear interpolation between start and end values.

Sprague Multipliers

- **Purpose**
  - To obtain single year population data from five-year age-group population data by interpolation. Thereafter, population at school entrance and respective school-going age population can be obtained.
- **Data requirement**
  - A reference year needs to be specified.
  - A single gender or both sexes must be selected.
  - Population of at least five consecutive age groups, started at any age-group must be provided.

Sprague Multipliers

- **Output**

Cohort Analysis

- **Purpose**
  - One of the major concerns in educational management is to assess the efficiency.
  - the "internal efficiency" - as the optimal relationship between inputs and outputs of a system.
  - Calculating the efficiency of the education system by producing a set of educational indicators reflecting the several internal efficiency measures.

Cohort Analysis

- **Data requirement**
  - Enrolment by grades in base year (year t)
  - Enrolment and repeaters by grades in succeeding year (i.e. year t+1)
  - Graduates in reference year. (optional)
  - Net transfers during the reference year. (optional)
  - In-transfers at the beginning of the second year. (optional)

Cohort Analysis

- **Output**
  1. Promotion Rate,
  2. Repetition Rate,
  3. Dropout Rate,
  4. Adjusted promotion rate,
  5. Survivors to the Grade,
  6. Average study time at Grade,
  7. Pupil-years invested per Graduate,
  8. Coefficient of Internal Efficiency.
Cohort Analysis

- Output

Enrolment Projection

- Purpose
  - For educational planning, it is necessary to estimate the enrolment and corresponding resource requirements
  - To facilitate this by producing such basic identities required for effective planning by simulating several scenarios for variety of policy alternatives
  - To introduce and demonstrates the basic concepts of the enrolment projection technique, calculation of required indicators and estimation of resource requirements

<table>
<thead>
<tr>
<th>Enrolment Projection</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ten different tables containing different information will be produced in the separate sheet “projection” for next 10 years. The tables include:</td>
<td></td>
</tr>
<tr>
<td>1. Demographic (population) data and gross enrolment ratio (GER)</td>
<td></td>
</tr>
<tr>
<td>2. Gross admission rate (AIR) and new entrants to first grade of primary</td>
<td></td>
</tr>
<tr>
<td>3. Student flow (promotion, repetition and dropout) rates by grade</td>
<td></td>
</tr>
<tr>
<td>4. Enrolment by grade and total enrolment at the primary level</td>
<td></td>
</tr>
</tbody>
</table>

Enrolment Projection

- Data requirement
  - Education related data (minimum of two consecutive years):
    - Number of schools
    - Number of teaching staff
    - Number of non-teaching staff
    - Number of classrooms
    - Enrolment and repeaters by grade
    - Graduates from the terminal grade of the level
    - Number of classes (pupil groups) by grade

Enrolment Projection

- Data requirement
  - Basic information:
    - Education level (i.e. Primary)
    - Years of study (in that level)
    - Starting grade of the level (i.e. 1 for Primary level)
    - Minimum admission age (i.e. 6 years for Primary level)
  - Demographic data (minimum of two consecutive years):
    - Entrance-age population for the education level (i.e. 6 years old population for Primary in some countries depending on the official regulation)
    - Growth of Entrance-age population
    - School-age population for the education level

Enrolment Projection

- Data requirement
  - Education related data (minimum of two consecutive years):
    - Average annual salary per teacher
    - Average annual salary per non-teaching staff
    - Pupil-related expenditure per pupil
    - School-related expenditure per school
    - Central and other non-school expenditure (as a whole for the level)
    - Construction expenditure per classroom
    - Other investment (capital) expenditure (as a whole for the level)
Enrolment Projection

- Output
  6. Number of classes by grade and classrooms need
  7. Schools, teachers and non-teaching school staff
  8. Recurrent expenditure: salaries (for teaching and non-teaching school staff)
  9. Other recurrent expenditures
  10. Capital and total education expenditure

Gini Coefficient

- Purpose
  - summary measure of the degree of dispersion in the distribution of a given variable
  - used to represent disparities in the distribution of enrolment, for example among regions or gender.
- Data requirement
  - Number of students enrolled for at least 2 grades must be entered for geographical region, or gender or period

Gini Coefficient

- Output

Brief demonstration of Analytical tools

Criteria for having quality data for producing good indicators

- selecting quality and relevant indicators is essential
- both relevant indicator with poor data or poor indicator with quality data are useless
- pay attention to data collection process to ensure the quality and availability
- key criteria
  - validity
  - reliability
  - Representativeness and timeliness
### Validity
- Data may not be valid, if
  - inaccurate measurement tools are used in collecting data
  - sample is unrepresentative (not from correct target population; small sample size)
  - data is incomplete
  - surveyors (evaluators) are biased

### Reliability
- Data reliability refers to the stability or consistency of the data collection
- data collection process must be consistent from year to year and from place to place
  - use consistent sampling method
  - employ the same or comparable data collection instruments and procedures
  - only reliable data can reflect real changes

### Representativeness
- representative if accurately reflect the population they are intended to describe
- use well-tested sampling methods strictly
- all units of a population must have an equal chance of being selected for the sample
- adequate sample size

### Timeliness
- refers to two elements:
  - frequency and
  - currency
- data should be available on a frequent enough to inform the changes over time
- data should be sufficiently up to date to reflect current situation

### Data errors
1. Measurement error
   - results primarily from the poor design or management of a data collection process
   - Sources measurement of error
     - sampling error (unrepresentative samples)
     - non-sampling error
       - poor design of the data-collection instrument
       - poorly trained or partisan enumerators
       - incomplete or untruthful answers from respondents

2. Transcription Error
   - errors in copying
   - data entry errors
   - rounding
   - Sources transcription error
     - lower qualification
     - poorly trained data entry clerk
     - poor data entry design/program
     - overloaded work
     - complicated data-collection instruments
<table>
<thead>
<tr>
<th>Remedial measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>for transcription errors:</td>
</tr>
<tr>
<td>• employ qualified persons</td>
</tr>
<tr>
<td>• cross-checking and thorough verification</td>
</tr>
<tr>
<td>for measurement errors:</td>
</tr>
<tr>
<td>1) assess the types and sources of errors</td>
</tr>
<tr>
<td>2) estimate the approximate levels of likely error</td>
</tr>
<tr>
<td>3) assess the comparative magnitude of error with the expected change</td>
</tr>
<tr>
<td>4) decide whether alternative data sources (or indicators) need to be explore</td>
</tr>
</tbody>
</table>