International Comparative Education Data and Indicators

UNESCO's Vision: Quality Education Transforms Lives

- When:
  - Accessible to all
  - Relevant
  - Underpinned by core shared values

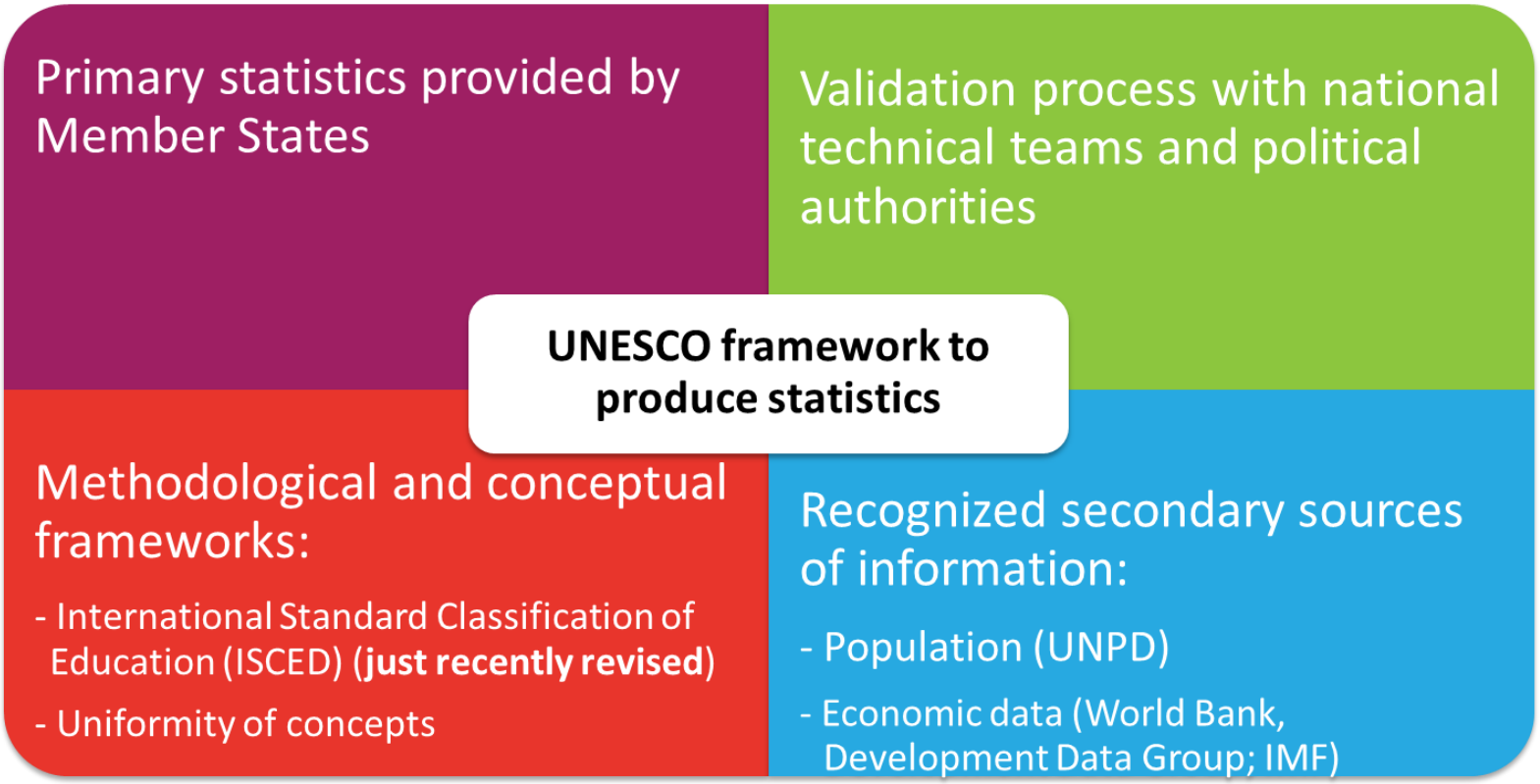
- Influences:
  - Poverty reduction
  - Improvements in health and livelihood
  - Prosperity increase
  - Inclusiveness
  - More sustainable and peaceful societies

UNESCO Institute for Statistics: Mission

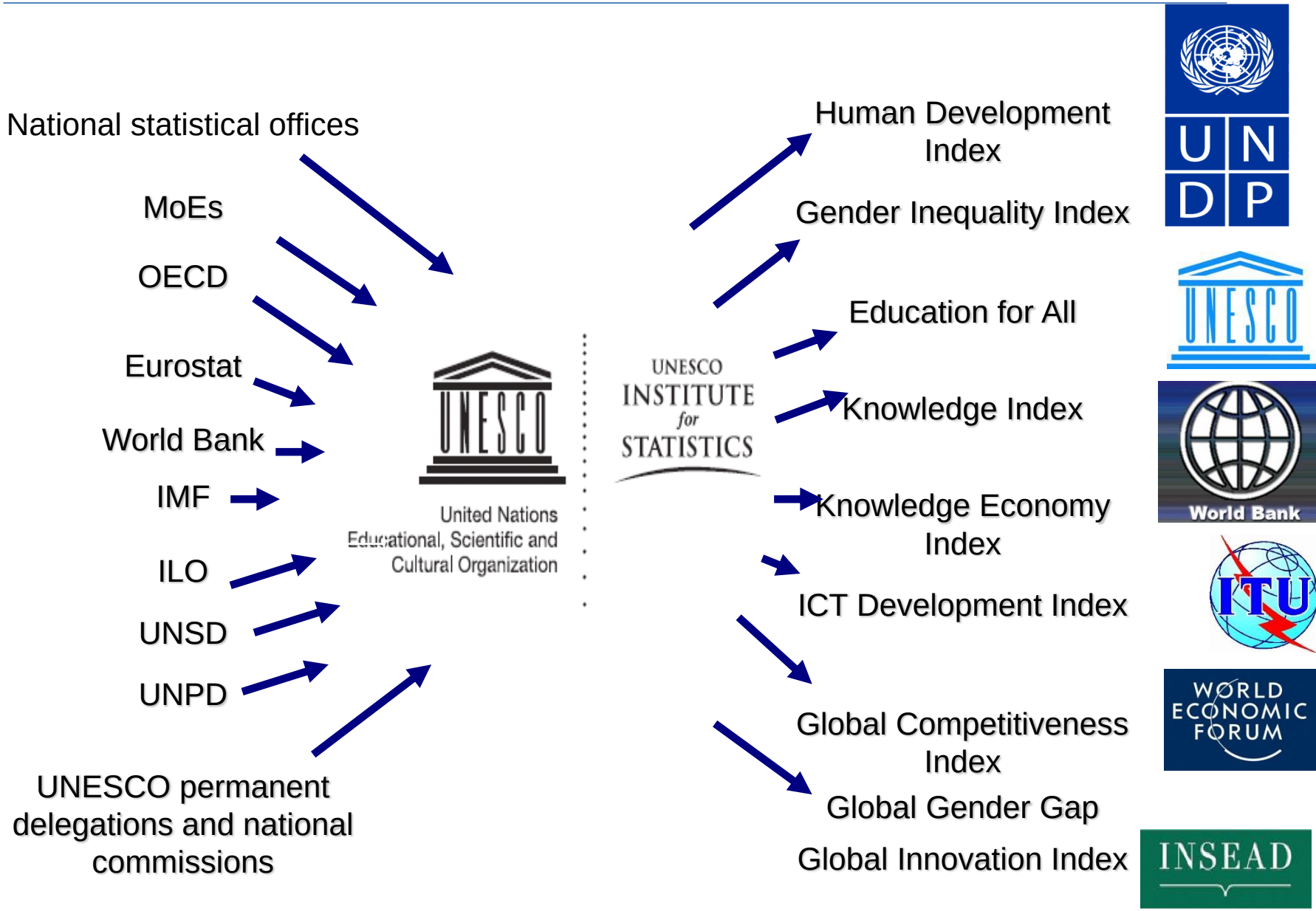
- Mandated to produce, update, analyse and disseminate international databases for:
  - Education
  - Science, technology and innovation
  - Culture
  - Communication and information

- History of UIS
  - Established in 1999
  - Located in Montreal, Canada;
  - with staff also based in several UNESCO field offices
  - Staff: 100 people

UIS Core Work: Production of Internationally Comparable Official Statistics



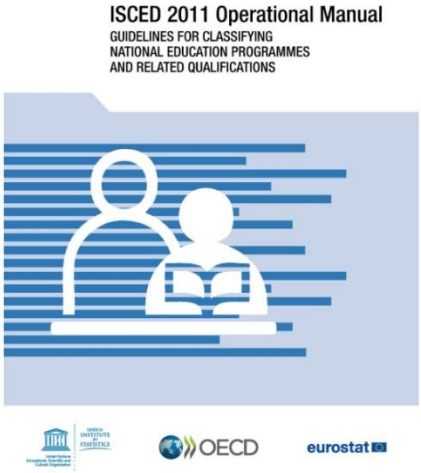
UIS work flow and impact

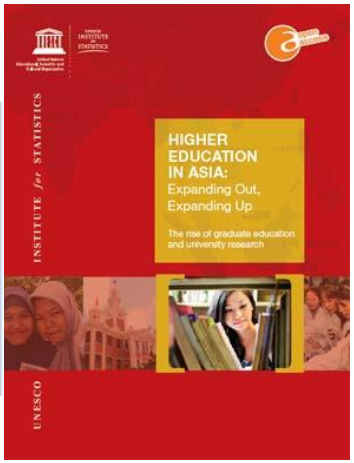


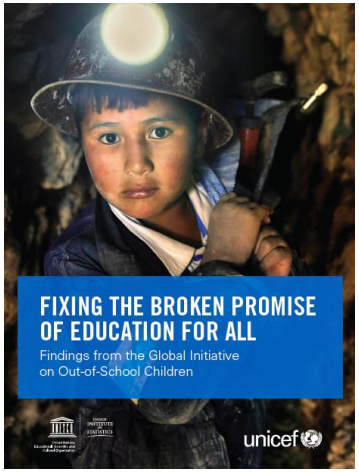
Products

UIS publications

- Thematic reports
- Factsheets
- Information notes
- Technical papers



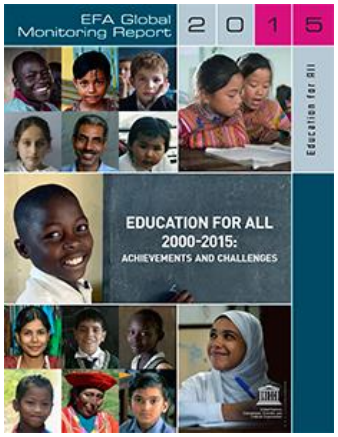


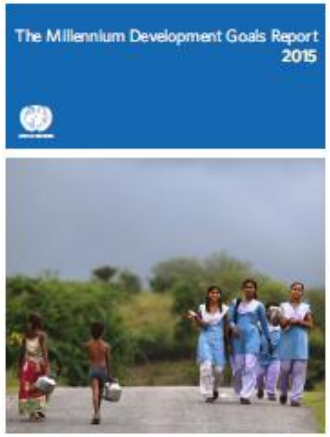


UIS on-line data centre

Over 1,000 types of indicators and raw data on education, literacy, science and technology, culture and communication
from more than 200 Member States from 1970-2013

Other international high-profile publications





THE INDICATOR

- An indicator is that which points out or directs attention to something
- Gives a broad indication of the state of the situation being investigated
- Relative state of development of different systems accomplished over a period of time in a specified field of human concern

  Ex. Primary enrolment of two districts do not produce any information but the same, if linked to corresponding age-specific population can be used to compare the status of primary education

Education Indicators

- Enable management to monitor effectiveness and efficiency in the delivery of education services
- Enable judgments on key aspects of the functioning of the education system
- Useful tools to identify and measure changes in the education system over time, including the effect of planned interventions
- When indicators are produced on a regular basis they can reveal possible changes in response to policy actions

Please give me some examples of education Indicators

Identification of Indicators of Education

Framework: "Education as a Production Function"

The education system can be viewed as a form of "production" which has three components:

- Inputs
- Processes
- Output (and Outcome)

Then, basic education indicators can be identified and grouped under these categories.

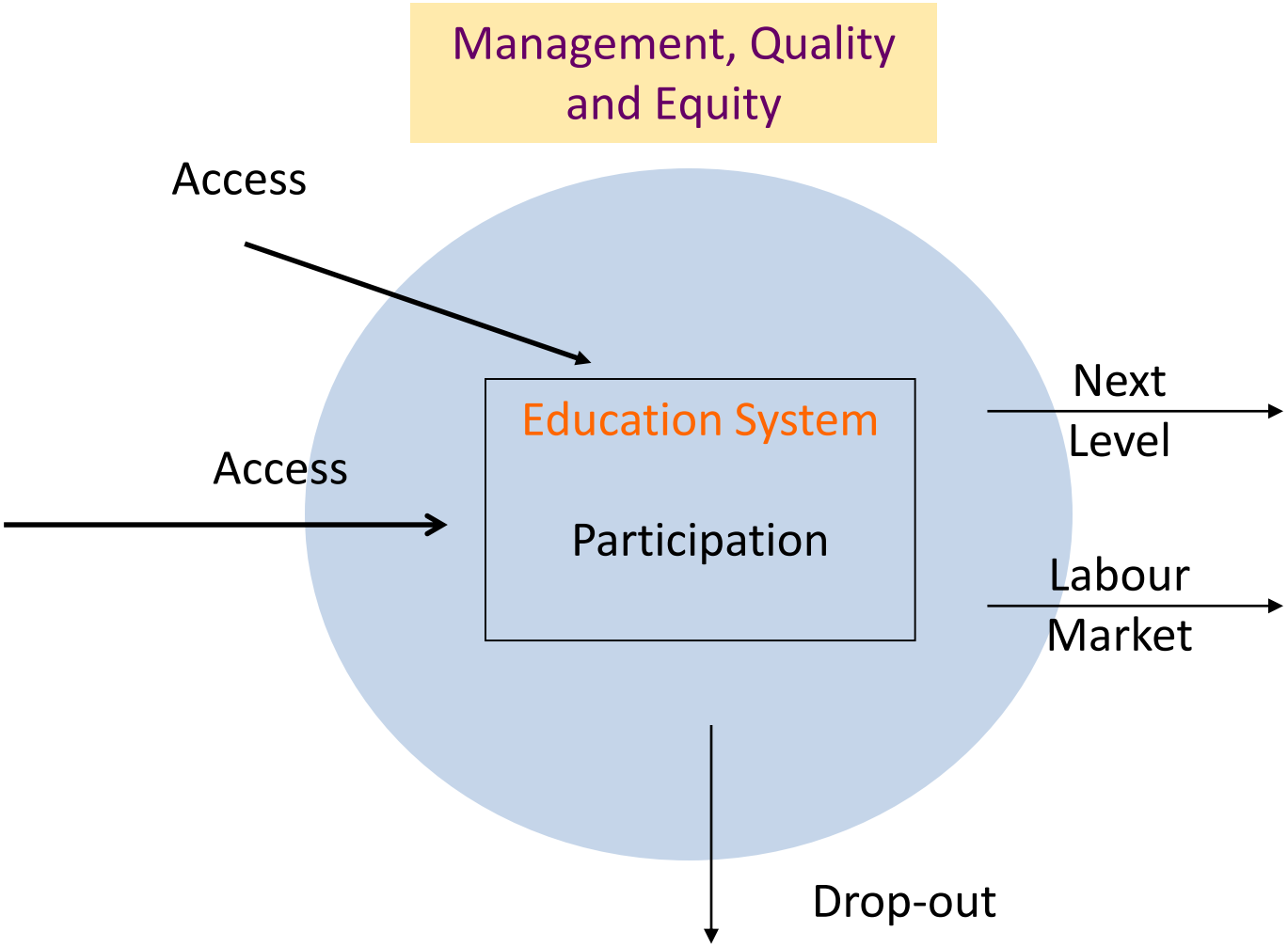
Identification of Indicators of Education

Framework: "Education as a Basic Social Service"

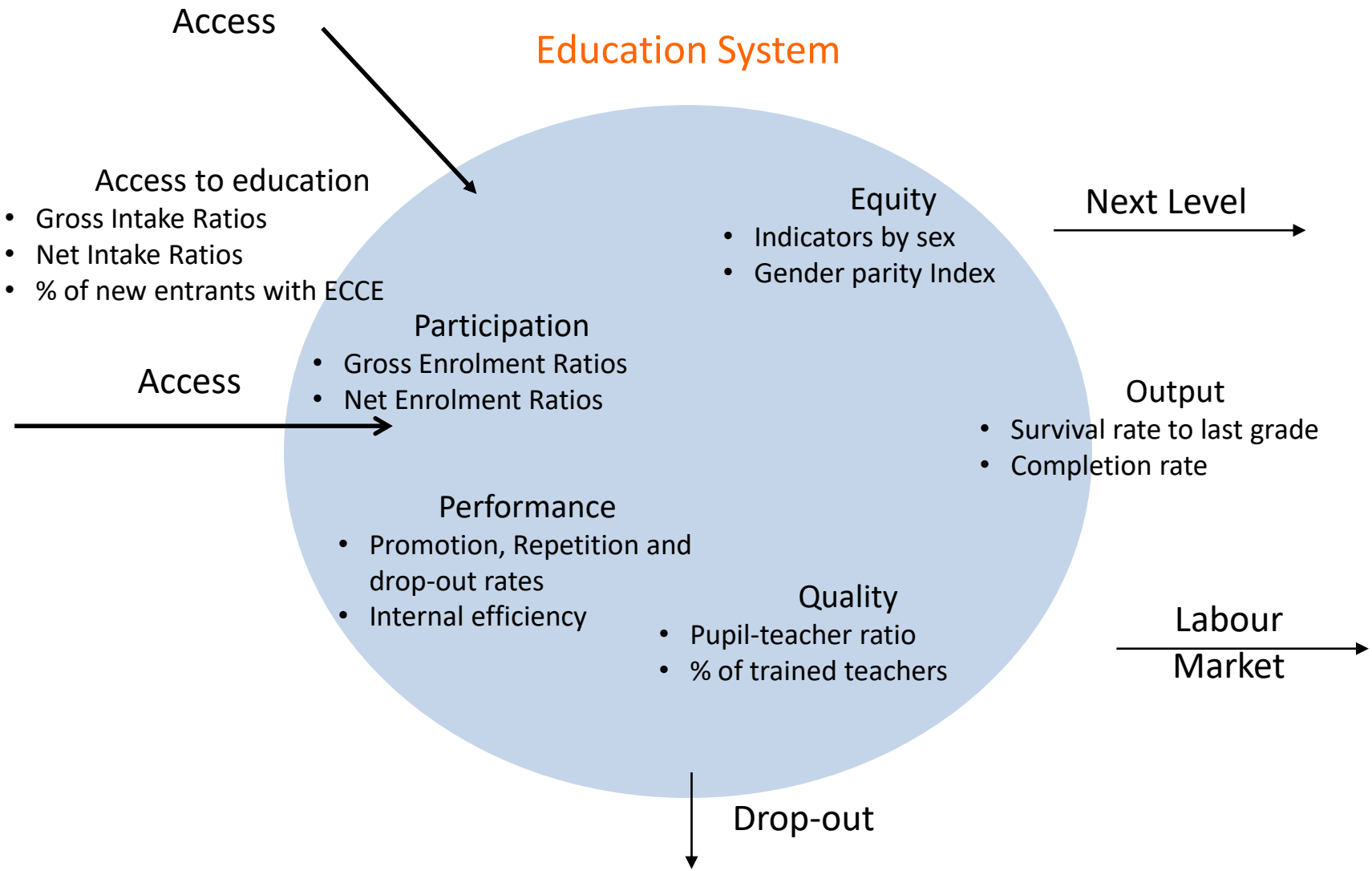
If education is viewed as a “basic social service“, basic education indicators can be identified under three areas:

- Access and Participation
- Quality
- Equity and Management

Monitoring Education from Various Aspects



Monitoring Education from Various Aspects



Analytical Framework

Issues / Analysis	All Education Sub-sectors					
	Demand	Resources	Access and Participation	Quality and Performance	Equity (Including Gender)	Output and Outcome
Meeting Goals, targets						
Trends, changes						
Gaps, Differences						
Finding reasons						

Access indicators

- Three main indicators are used to measure access to education:
  - Gross (apparent) intake ratio to primary education
  - Net intake rate to primary education
  - Adjusted net intake rate to primary education

Access Indicators	Definition	Data Required
Gross Intake Ratio in Primary	Total new entrance in Grade 1(regardless of age) of pri as % of official pri school entrance age population	- Total new entrants to grade 1 of primary education - Population of the official primary school-entrance age
Net Intake Ratio in Primary	Total new entrance of official entrance age children in Grade 1 in primary as % of official pri school entrance age population	- New entrants in first grade of primary education by single years of age; - Population of the official primary school-entrance age.
Adjusted Net Intake Ratio in Primary	Total Enrollment of of pri age children in primary level (regardless of grades) as % of official pri school entrance age population	- Enrolment in primary education by single years of age; - Population of the official primary school-entrance age.

Similar calculation can be done for lower secondary education

GIR vs NIR vs ANIR

	GIR	**NIR**	**ANIR**
Numerator	Total number of new entrants to Grade 1 **(All ages)**	Total number of Grade 1 pupil of the **official school entrance age**	Total Enrollment of pri entrance age children in primary level **(regardless of grades**
Denominator	Total number of official primary school entrance age population		

Participation indicators

- Gross enrolment ratio (GER)
- Net enrolment rate (NER)
- Adjusted net enrolment rate (ANER)
- Age specific enrolment rate (ASER)

Participation Indicators	Definition	Data Required
Gross Enrollment Ratio (GER)	Total enrollment in primary level (regardless of age) as % of official pri enrollment age population	Enrolment in primary education; Population of the official primary school age.
Net Enrollment Rate (NER)	Total enrollment of official primary age children in primary as % of official pri age population	Enrolment in primary education by single years of age; Population of the official primary school age.
Adjusted Net Enrollment Rate (ANER) in Primary	Total Enrollment of pri age children in primary or lower secondary level as % of official pri age population	Enrolment in primary and secondary education by single years of age; Population of the official primary school age.

Similar calculation can be done for lower secondary education

GER vs NER vs ANER

	GER	NER	ANER
Numerator	Total number of Pupil enrolled in primary (**All ages**)	Total number of pupil of the **official school entrance age enrolled in Primary**	Total Enrollment of pri age children in primary and lower secondary level **(regardless of grades**
Denominator	Total number of official primary age population		

Participation indicators…

Age specific enrolment rate (ASER)

Enrolment of a specific single age enrolled, **irrespective of the level of education**, as a percentage of the population of the same age.

- Required data:
  - Enrolment of the population of age *a*
  - Population of age *a*

- $ASER_a = \frac{\text{Enrolment of the population of age } a}{\text{Population of age } a} * 100$

- School life expectancy (SLE) = Sum of ASERs of all ages

Calculation of ASER

Age	Enrolment A	Population B	ASER
4	1251946	25075533	**(A/B)** 0.050
5	12496696	24969336	**(A/B)** 0.500
6	27214848	24899828	**(A/B)** 1.093
7	24966380	24855370	**(A/B)** 1.004
8	23058672	24824318	**(A/B)** 0.929
9	21555461	24795033	**(A/B)** 0.869
10	14696847	24773268	**(A/B)** 0.593
11	5193247	24764767	**(A/B)** 0.210
12	2122674	24670941	**(A/B)** 0.086
13	653132	24445363	**(A/B)** 0.027
14	315828	24128566	**(A/B)** 0.013
SLE			**Sum of ASER: 5.375**

School Life Expectancy (SLE)

Definition: SLE is defined as the total number of years of schooling that a child entering the school system could expect to receive in the future, assuming that the probability of his or her enrolment is equal to prevailing participation rates.

- It describes the average number of years that a child is likely to spend in the educational system of his or her country.
- It indicates the average duration of schooling in years, not the number of grades reached.
- It is not necessarily a measure of actual or current attainment but rather of what the next cohort entering the schooling system may achieve.

System Performance Indicators

Key performance indicators

- Promotion rate: is the proportion of pupils who have successfully completed a grade and proceeded to the next grade the following year.
- Repetition rate: the proportion of pupils who repeat a grade once or twice. The repetition rate of grade g, year y is obtained by dividing repeaters of grade g, year y+1, by enrolment in grade g, year y.
- Drop-out rate: the proportion of pupils who leave the system without completing a given grade in a given school year.
- Percentage of repeaters: Percentage of repeaters at a particular grade.

Survival Rate

- **Definition:** The percentage of a cohort of pupils enrolled in grade 1 of the primary level of education in a given school year who are expected to reach a specific grade (Survival rate to Grade 5).

- **Purpose:** To assess the “holding power” and internal efficiency of an education system. The survival rate to Grade 5 indicates the proportion of a pupil cohort that completes Grade 4 and reaches Grade 5. Conversely, it indicates the magnitude of drop-out before Grade 5.

Tertiary Gross Enrollment Ratio

With a typical education system at the age of 17, a child complete secondary education

$$\text{Tertiary GER} = \frac{\text{Total Enrollment in all levels of Tertiary}}{\text{Population of age 18-22 years}} \times 100\%$$

Measuring Quality

- Pupil Teacher Ratio (PTR)
- Pupil classroom Ratio (PCR)
- % Trained teachers (%TT)
- % of qualified Teachers (%QT)
- Student learning outcomes related indicators

(UIS does not published the indicators)

Admission Rate

Gross Admission Rate =

$$\frac{\text{Total Grade "I" Enrolment}}{\text{Population of Age “6” Year}} \times 100$$

Apparent Admission Rate =

$$\frac{\text{New Entrants in Grade “I” (=enrolment-repeater)}}{\text{Population of Age “6” Year}} \times 100$$

Age-specific Admission Rate =

$$\frac{\text{New Entrants of Age `6' in Grade "I"}}{\text{Population of Age "6" Year}} \times 100$$

Enrolment Ratio

Over-All Enrolment Ratio =

$$\frac{\text{Total enrolment in Grades I-XII}}{\text{Population in the age-group 6-17 years}} \times 100$$

if we take Enrolment in Grades I-V corresponding School-Age Population would be 6-11 Years

Age-Specific Enrolment Ratio and =

$$\frac{\text{Enrolment in age-group `a' in all levels of education in any grade}}{\text{population of a particular age `a'}} \times 100$$

Level Enrolment Ratio

Gross Enrolment Ratio (GER) =

$$\frac{\text{Total enrolment at school level `i'}}{\text{Population in age-group `a' which officially correspond to that level `i'}} \times 100$$

Net Enrolment Ratio (NER) is an improved version of the GER. In NER, over-age and under-age children are excluded from enrolment and then ratios to the respective age-specific population are obtained.

TRANSITION RATE

It is based on Student Flow Analysis

starts at the point where students enter into an education cycle

- I : Population of Admission Rate (`6' Year)
- II : Student Flow into the System : The Admission Rate
- III : Student Flow through the System : Promotion, Repetition and Drop-out Rates
- IV : Student Flow between Systems : The Transition Rate.

  3 possibilities –

  Students promoted to the next higher grade

  Students repeat their grades and

  Students dropped out from the system

TRANSITION RATE

- A student may complete the grade successfully and leave the school system
- A student may complete the grade successfully and then enrol in first grade of next higher cycle.

$$= \frac{\text{New Entrants into Grade VI in Year `t+1'}}{\text{Enrolment in Grade V in Year `t'}} \times 100$$

PROMOTION RATE

$$= \frac{\text{Number of Students Promoted to Grade `g+1' in Year `t+1'}}{\text{Total Number of Students in Grade `g' in Year `t'}} \times 100$$

repeaters who are included in Grade `g+1' enrolment taken out

REPETITION RATE

$$= \frac{\text{Number of Repeaters in Grade `g' in Year `t+1'}}{\text{Total Number of Students in Grade `g' in Year `t‘}} \times 100$$

DROP-OUT RATE

$$= \frac{\text{Number of Students Dropping out from Grade `g' in Year t}}{\text{Total Number of Students in Grade `g' in Year `t'}} \times 100$$

Promotion Rate + Repetition Rate + Drop-out Rate = 100

INPUT/OUTPUT RATIO

$$= \frac{\text{Number of Successful Completors X 5}}{\text{Total Student Years Invested}} \times 100$$

Wastage Ratio = 100 - Input/Output Ratio

Wastage may be on Account of Repeaters or Drop-outs

ATTENDANCE RATE

Attendance rate can be calculated in relation to the number of school working days and children actually attending a class.

For example, in a Class of 45 students in a school that functioned for 22 of 30 days in a month, attendance rate can be calculated in accordance to the actual number of days children attended schools. Some of them might have attended school for all the 22 days while others may not have. First, the maximum possible present days (attendance) is calculated by multiplying number of school days to number of students in a class. In this case it would come out (22 x 45) a total of 990 present days

PUPIL-TEACHER RATIO

$$= \frac{\text{Total Enrolment}}{\text{Total Teachers}}$$

Gender Parity Index (GPI)

- Ratio of the female to male values of GER
- A GPI of 1 indicates parity between sexes