4. Educational Indicators

The educational planners, researchers and administrators may frequently need to evaluate various indicators of education using the data on school education. Hence, it is necessary to have the knowledge of definitions and calculation method along with formula for the indicators. In view of this, definition, calculation method and formula for important indicators, categorized into major aspects of educational concerns, namely, demographic, access to schooling, participation, equity, infrastructure, quality inputs, finance, and efficiency are presented below.

4.1 Indicators of Demography (School-Age Population)

4.1.1 Percentage of Child Population in Different Age Groups Corresponding to Different Stages/Levels of School Education to the Total Population

Definition: The number of children in an age group that officially corresponds to a stage/level of school education expressed as a percentage of total population (of all ages).

Calculation method: Divide the total number of children in the age group that officially corresponds to the given stage/level of school education by the total population of all ages, and multiply by 100.

Formula:

\[ \%P^h_a = \left( \frac{P^h_a}{P} \right) \times 100 \]

Where:

- \( \%P^h_a \) = Percentage of child population in the age group \( a \) which officially corresponds to the stage/level of school education \( h \) (\( h = \) primary, upper primary, secondary and higher secondary stage/level) to the total population.
- \( P^h_a \) = Child population in the age group \( a \) which officially corresponds to the stage/level of school education \( h \).
- \( P \) = Total population of all ages.

Remarks:

(i) In India, the age groups corresponding to primary, upper primary, secondary and higher secondary stage/level at the national level in 5+3+2+2 pattern of school education are considered as 6 to below 11 years, 11 to below 14 years, 14 to below 16 years and 16 to below 18 years, respectively.

(ii) The population may be considered by sex and social group (SC/ST/OBC/EBMC/Others).
4.2 Indicators of Access to Schooling

4.2.1 Percentage of Rural Population Having Facility of a School Stage Within x km

**Definition:** The population of rural habitations having facility of a school stage within a distance prescribed for that stage expressed as a percentage of total rural population.

**Calculation method:** Divide the population of rural habitations having facility of a given school stage within the distance prescribed, by total rural population, and multiply by 100.

**Formula:**

\[
\%A_h^x = \left( \frac{A_h^x}{H} \right) \times 100
\]

Where:

\( \%A_h^x \) = Percentage of rural population having facility of given school stage \( h \) (primary, upper primary, secondary and higher secondary stage) within the distance of \( x \) km (kindly refer the remark given below for distance criterion).

\( A_h^x \) = Rural population having facility of school stage \( h \) within the distance of \( x \) km.

\( H \) = Total rural population.

**Remark:** The NCERT documents on educational surveys reveal that the primary, upper primary, secondary and higher secondary stage schooling facility in India should be made available within a distance of 1, 3, 5 and 8 km, respectively.

4.2.2 Percentage of Villages Having Facility of a School Stage

**Definition:** The number of villages having facility of a school stage expressed as a percentage of total number of villages.

**Calculation method:** Divide the number of villages having facility of a school stage by total number of villages, and multiply by 100.

**Formula:**

\[
\%A^h = \left( \frac{A^h}{H} \right) \times 100
\]

Where:

\( \%A^h \) = Percentage of villages having facility of school stage \( h \) (primary, upper primary, secondary and higher secondary stage).

\( A^h \) = Number of villages having facility of school stage \( h \).

\( H \) = Total number of villages.
4.2.3 Percentage of Rural Habitations Having Facility of a School Stage Within x km

**Definition:** The rural habitations having facility of a school stage within a distance prescribed for that stage expressed as a percentage of total number of rural habitations.

**Calculation method:** Divide the number of rural habitations having facility of a school stage within the distance prescribed, by total number of rural habitations, and multiply by 100.

**Formula:**

\[
\%A^h_x = \left(\frac{A^h_x}{H}\right) \times 100
\]

Where:

\%A^h_x = Percentage of rural habitations having facility of school stage \( h \) (primary, upper primary, secondary and higher secondary stage) within the distance of \( x \) km (kindly refer the remark given below for distance criterion).

\( A^h_x \) = Number of rural habitations having facility of school stage \( h \) within the distance of \( x \) km.

\( H \) = Total number of rural habitations.

**Remark:** The NCERT documents on educational surveys reveal that the primary, upper primary, secondary and higher secondary stage schooling facility in India should be made available within a distance of 1, 3, 5 and 8 km, respectively.

4.2.4 Percentage of Schools Having Pre-Primary Stage

**Definition:** The number of schools having pre-primary stage expressed as a percentage of total number of schools.

**Calculation method:** Divide the number of schools having pre-primary stage by total number of schools, and multiply by 100.

**Formula:**

\[
\%PS = \left(\frac{PS}{TS}\right) \times 100
\]

Where:

\%PS = Percentage of schools having pre-primary stage.

\( PS \) = Number of schools having pre-primary stage.

\( TS \) = Total number of schools.

**Remark:** It is valid for any category of school (primary or upper primary or secondary or higher secondary or all schools).
4.3 Indicators of Participation

4.3.1 Apparent Intake Rate

Definition: Total number of new entrants in the first grade of primary education, regardless of age, expressed as a percentage of the population at the official primary school-entrance age.

Calculation method: Divide the number of new entrants in grade 1, irrespective of age, by the population of official school-entrance age, and multiply the result by 100.

Formula:

\[ \text{AIR}^t = \left( \frac{N^t}{P^a} \right) \times 100 \]

Where:

\( \text{AIR}^t \) = Apparent Intake Rate in school-year \( t \).

\( N^t \) = Number of new entrants in the first grade of primary education, in school-year \( t \).

\( P^a \) = Population of official primary school entrance-age \( a \), in school-year \( t \).

Remark: When data on new entrants are not separately reported, they can be derived by subtracting the number of repeaters from enrolment in the first grade, before calculating the apparent intake rate.

4.3.2 Net Intake Rate

Definition: New entrants in the first grade of primary education who are of the official primary school-entrance age, expressed as a percentage of the population of the same age.

Calculation method: Divide the number of children of official primary school-entrance age who enter the first grade of primary education by the population of the same age, and multiply the result by 100.

Formula:

\[ \text{NIR}^t = \left( \frac{N^t_a}{P^a} \right) \times 100 \]

Where:

\( \text{NIR}^t \) = Net Intake Rate in school-year \( t \).

\( N^t_a \) = Number of children of official primary school-entrance age \( a \) who enter the first grade of primary education, in school-year \( t \).

\( P^a \) = Population of official primary school entrance-age \( a \), in school-year \( t \).
4.3.3 Gross Enrolment Ratio

**Definition:** Total enrolment in a specific level of education, regardless of age, expressed as a percentage of the eligible official school-age population corresponding to the same level of education in a given school-year.

**Calculation method:** Divide the number of pupils (or students) enrolled in a given level of education regardless of age by the population of the age-group which corresponds to the given level of education, and multiply the result by 100.

**Formula:**

\[
\text{GER}_t^h = \left( \frac{E_t^h}{P_{t,a}^h} \right) \times 100
\]

Where:

\[
\text{GER}_t^h = \text{Gross Enrolment Ratio at level of education } h \text{ in school-year } t.
\]

\[
E_t^h = \text{Enrolment at the level of education } h \text{ in school-year } t.
\]

\[
P_{t,a}^h = \text{Population in age-group } a \text{ which officially corresponds to the level of education } h \text{ in school-year } t.
\]

Example: If the entrance age for primary education is 7 years with a duration of 6 years then \(a\) is (7-12) years.

4.3.4 Net Enrolment Ratio

**Definition:** Enrolment of the official age-group at a given level of education expressed as a percentage of the corresponding population.

**Calculation method:** Divide the number of pupils enrolled who are of the official age-group at a given level of education by the population for the same age-group and multiply the result by 100.

**Formula:**

\[
\text{NER}_t^h = \left( \frac{E_{t,a}^h}{P_{t,a}^h} \right) \times 100
\]

Where:

\[
\text{NER}_t^h = \text{Net Enrolment Ratio at level of education } h \text{ in school-year } t.
\]

\[
E_{t,a}^h = \text{Enrolment of the population of age-group } a \text{ at level of education } h \text{ in school-year } t.
\]

\[
P_{t,a}^h = \text{Population in age-group } a \text{ which officially corresponds to the level of education } h \text{ in school-year } t.
\]

Example: If the entrance age for primary education is 7 years with a duration of 6 years then \(a\) is (7-12) years.
4.3.5 Age Specific Enrolment Ratio

Definition: Percentage of the population of a specific age enrolled, irrespective of the level of education.

Calculation method: Divide the number of pupils (or students) of a specific age enrolled in educational institutions at all levels of education by the population of the same age and multiply the result by 100.

Formula:

$$\text{ASER}_a^t = \left( \frac{E_a^t}{P_a^t} \right) \times 100$$

Where:

- $\text{ASER}_a^t$ = Age Specific Enrolment Ratio of the population of age $a$ in school-year $t$.
- $E_a^t$ = Enrolment of the population of age $a$ in school-year $t$.
- $P_a^t$ = Population of age $a$ in school-year $t$.

Remark: This method may also be used separately to calculate ASER of different age-groups corresponding to various levels of education. The calculation is the same, the sole difference is being that the enrolment refers only to age-group corresponding to one level of education, for example primary education.

4.3.6 Enrolment in Secondary Education by Type of Education

Definition: Percentage distribution of students enrolled in secondary education, according to the type of education, i.e., general and vocational/technical education, including teacher training.

Calculation method: Divide the number of students enrolled in each type of secondary education by the total enrolment in secondary education in a given year, and multiply the result by 100.

Formula:

$$\% E_s^t = \left( \frac{E_s^t}{\sum_{s=1}^{n} E_s^t} \right) \times 100$$

Where:

- $\% E_s^t$ = Percentage of students enrolled in secondary education of type $s$ in school-year $t$.
- $E_s^t$ = Number of students enrolled in secondary education of type $s$ in school-year $t$.
- $n$ = Number of types of secondary education.
4.3.7 Percentage of Private Enrolment

**Definition:** Enrolment in private educational institutions at a given level of education expressed as a percentage of total enrolment at the same level. By ‘private’ is meant here all educational institutions not operated by a public authority, whether or not they receive financial support from such authorities.

**Calculation method:** Divide the number of pupils (or students) enrolled in private educational institutions in a given level of education by the total enrolment (public and private) at the same level of education, and multiply the result by 100.

**Formula:**

\[
\%E_{p}^{t,h} = \frac{(E_{p}^{t,h} / E_{h}^{t})} * 100
\]

Where:

\%E_{p}^{t,h} = Percentage of pupils enrolled in private institutions at level of education \( h \) in school-year \( t \).

\( E_{p}^{t,h} \) = Number of pupils enrolled in private institutions at level of education \( h \) in school-year \( t \).

\( E_{h}^{t} \) = Total number of pupils enrolled in all types of institutions at level of education \( h \) in school-year \( t \).

4.4 Indicators of Equity

4.4.1 Enrolment in a School Stage by Sex and Social Group (SC/ST/OBC/EBMC/Others)

**Definition:** Percentage distribution of enrolment in a school stage according to sex and social group, namely, SC, ST, OBC, EBMC and Others.

**Calculation method:** Divide the enrolment of a given sex in each social group, namely, SC, ST, OBC, EBMC and Others in a given school stage by total enrolment of that school stage in a given school year, and multiply the result by 100.

**Formula:**

\[
\%E_{s,g}^{h,t} = \left(\frac{E_{s,g}^{h,t}}{E_{h}^{t}}\right) * 100
\]

Where:

\%E_{s,g}^{h,t} = Percentage of enrolment of sex \( s \) (boys/girls) in social group \( g \) (SC/ST/OBC/EBMC/Others) for a school stage \( h \) (primary, upper primary, secondary and higher secondary stage) in school-year \( t \).

\( E_{s,g}^{h,t} \) = Enrolment of sex \( s \) in social group \( g \) for a school stage \( h \) in school-year \( t \).

\( E_{h}^{t} \) = Total enrolment of school stage \( h \) in school-year \( t \).
### 4.4.2 Percentage of SC/ST/OBC/EMBC/Others Girls Enrolment to SC/ST/OBC/EMBC/Others Enrolment in a School Stage

**Definition:** The girls enrolment expressed as a percentage of total enrolment of a given social group (SC/ST/OBC/EBMC/Others) in a given school stage.

**Calculation method:** Divide the girls enrolment of a given school stage and social group by total enrolment of that school stage and social group, and multiply the result by 100.

**Formula:**

\[
\% \text{Eg}_s^{t,h} = \left( \frac{\text{Eg}_s^{t,h}}{\text{E}_s^{t,h}} \right) \times 100
\]

Where:

- \(\% \text{Eg}_s^{t,h}\) = Percentage of girls enrolment in social group \(s\) (= SC/ST/OBC/EBMC/Others) and school stage \(h\) (primary/upper primary/secondary/higher secondary) in school-year \(t\).
- \(\text{Eg}_s^{t,h}\) = Girls Enrolment in social group \(s\) in school stage \(h\) in school-year \(t\).
- \(\text{E}_s^{t,h}\) = Total enrolment of social group \(s\) in school stage \(h\) in school-year \(t\).

### 4.4.3 Percentage of Teachers by Sex and Social Group (SC/ST/OBC/EBMC/Others) in Different Categories of Schools

**Definition:** The number of teachers by sex and social group (SC/ST/OBC/EBMC/Others) expressed as a percentage of total number of teachers in a given category of schools.

**Calculation method:** Divide the number of teachers of a given sex and social group in a given category of schools by total number of teachers in that category of schools, and multiply the result by 100.

**Formula:**

\[
\% \text{T}_{s,g}^{c,t} = \left( \frac{\text{T}_{s,g}^{c,t}}{\text{T}^{c,t}} \right) \times 100
\]

Where:

- \(\% \text{T}_{s,g}^{c,t}\) = Percentage of teachers of sex \(s\) (male/female) and social group \(g\) (SC/ST/OBC/EBMC/Others) in school category \(c\) in school-year \(t\).
- \(\text{T}_{s,g}^{c,t}\) = Number of teachers of sex \(s\) and social group \(g\) in school category \(c\) in school-year \(t\).
- \(\text{T}^{c,t}\) = Total number of teachers in school category \(c\) in school-year \(t\).
4.5 Indicators of Infrastructure

4.5.1 Student Classroom Ratio (SCR) for Primary/Upper Primary/Secondary Schools

**Definition:** Average number of pupils (students) per classroom in primary/upper primary/secondary schools in a given school-year.

**Calculation method:** Divide the total number of pupils enrolled in primary/upper primary/secondary schools by the total number of classrooms in primary/upper primary/secondary schools in a given school-year.

**Formula:**

\[ \text{SCR}^t = \left( \frac{E^t}{C^t} \right) \]

Where:

- \( \text{SCR}^t \) = Student classroom ratio for primary/upper primary/secondary schools in school-year \( t \).
- \( E^t \) = Total enrolment in primary/upper primary/secondary schools in school-year \( t \).
- \( C^t \) = Total number of classrooms in primary/upper primary/secondary schools in school-year \( t \).

4.5.2 Percentage of Schools Without Building in a Given School Category

**Definition:** The number of schools of a given category without having building is expressed as a percentage of total number of schools in that category.

**Calculation method:** Divide the number of schools of a given category without having building by total number of schools in that category, and multiply by 100.

**Formula:**

\[ \%\text{SWB}^c = \left( \frac{\text{SWB}^c}{\text{TS}^c} \right) \times 100 \]

Where:

- \( \%\text{SWB}^c \) = Percentage of schools of category \( c \) without having building.
- \( \text{SWB}^c \) = Number of schools of category \( c \) without having building.
- \( \text{TS}^c \) = Total number of schools in category \( c \).

**Remark:** Similarly, percentage of schools having *pucca* or *kuchcha* building may be computed.
4.5.3 Percentage of Schools Having x Classrooms (x = 1, 2, 3, ..., n) in a Given School Category

**Definition:** The number of schools of a given category having x classrooms (x = 1, 2, 3, ..., n; where n is the maximum number of classrooms in a school belonging to given category) expressed as a percentage of total number of schools in that category.

**Calculation method:** Divide the number of schools of a given category having x classrooms (x = 1, 2, 3, ..., n) by total number of schools in that category, and multiply by 100.

**Formula:**

\[
\%SWC^c_x = \left( \frac{SWC^c_x}{TS^c} \right) \times 100
\]

Where:

\%SWC^c_x = Percentage of schools having x classrooms (x = 1, 2, 3, ..., n) in school category c.

SWC^c_x = Number of schools of category c having x classrooms.

TS^c = Total number of schools in category c.

4.5.4 Percentage of Schools Having Toilet in a Given School Category

**Definition:** The number of schools of a given category having toilet is expressed as a percentage of total number of schools of that category.

**Calculation method:** Divide the number of schools of a given category having toilet by total number of schools of that category, and multiply by 100.

**Formula:**

\[
\%ST^c = \left( \frac{ST^c}{TS^c} \right) \times 100
\]

Where:

\%ST^c = Percentage of schools of category c having toilet.

ST^c = Number of schools of category c having toilet.

TS^c = Total number of schools in category c.

4.5.5 Percentage of Schools with Girl’s Toilet in a Given School Category

**Definition:** The number of schools of a given category having girl’s toilet expressed as a percentage of total number of schools of that category.

**Calculation method:** Divide the number of schools of a given category having girl’s toilet by total number of schools of that category, and multiply by 100.
Formula:

\[ \%\text{SGT}^c = \left( \frac{\text{SGT}^c}{\text{TS}^c} \right) \times 100 \]

Where:

\%\text{SGT}^c = \text{Percentage of schools of category } c \text{ having girl’s toilet.}

\text{SGT}^c = \text{Number of schools of category } c \text{ having girl’s toilet.}

\text{TS}^c = \text{Total number of schools in category } c.

4.6 Indictors of Quality Inputs

4.6.1 Percentage of Students in Schools without Building in a Given School Category

Definition: Enrolment of schools of a given category that do not have building expressed as a percentage of enrolment of all schools of that category.

Calculation method: Divide the enrolment of schools of a given category that do not have building by enrolment of all schools of that category, and multiply the result by 100.

Formula:

\[ \%\text{EWB}^t_c = \left( \frac{\text{EWB}^t_c}{\text{E}^t_c} \right) \times 100 \]

Where:

\%\text{EWB}^t_c = \text{Percentage of students in schools that do not have building in school category } c \text{ (primary or upper primary or secondary or higher secondary or all schools) in school-year } t.

\text{EWB}^t_c = \text{Enrolment of schools that do not have building in school category } c \text{ in school-year } t.

\text{E}^t_c = \text{Enrolment of all schools of category } c \text{ in school-year } t.

4.6.2 Percentage of Schools not Having Furniture for Students (Teachers) in a Given School Category

Definition: The number of schools of a given category that do not have furniture for students (teachers) expressed as a percentage of total number of schools of that category.

Calculation method: Divide the number of schools of a given category that do not have furniture for students (teachers) by total number of schools of that category, and multiply the result by 100.

Formula:

\[ \%\text{SF}^t_c = \left( \frac{\text{SF}^t_c}{\text{S}^t_c} \right) \times 100 \]
Where:

\[
\% SF_c^t = \frac{SF_c^t}{S_c^t} = \text{Percentage of schools that do not have furniture for students (teachers) in school category } c \text{ (primary or upper primary or secondary or higher secondary or all schools) in school-year } t.
\]

\[
SF_c^t = \text{Number of schools that do not have furniture for students (teachers) in school category } c \text{ in school-year } t.
\]

\[
S_c^t = \text{Total number of schools in school category } c \text{ in school-year } t.
\]

### 4.6.3 Percentage of Schools Having Mother Tongue as a Medium of Instruction at a Given School Stage

**Definition:** The number of schools having mother tongue as a medium of instruction at a given school stage is expressed as a percentage of total number of schools having that stage.

**Calculation method:** Divide the number of schools having mother tongue as a medium of instruction at a given school stage by total number of schools having that stage, and multiply the result by 100.

**Formula:**

\[
\% SM_c^t = \left( \frac{SM_c^t}{S_c^t} \right) \times 100
\]

Where:

\[
\% SM_c^t = \text{Percentage of schools having mother tongue as a medium of instruction at school stage } c \text{ (primary or upper primary or secondary) to total number of schools having that stage in school-year } t.
\]

\[
SM_c^t = \text{Number of schools having mother tongue as a medium of instruction at school stage } c \text{ in school-year } t.
\]

\[
S_c^t = \text{Total number of schools having school stage } c \text{ in school-year } t.
\]

### 4.6.4 Percentage of Secondary (Higher Secondary) Schools Having Library Facility

**Definition:** The number of secondary (higher secondary) schools having library facility expressed as a percentage of total number of secondary (higher secondary) schools.

**Calculation method:** Divide the number of secondary (higher secondary) schools having library facility by total number of secondary (higher secondary) schools, and multiply by 100.

**Formula:**

\[
\% SL = \left( \frac{SL}{TS} \right) \times 100
\]

Where:

\[
\% SL = \text{Percentage of secondary (higher secondary) schools having library facility.}
\]

\[
SL = \text{Number of secondary (higher secondary) schools having library facility}
\]

\[
TS = \text{Total number of secondary (higher secondary) schools.}
\]
4.6.5 Percentage of Trained Teachers in a Given School Category

**Definition:** The number of trained teachers expressed as a percentage of total number of teachers in a given school category.

**Calculation method:** Divide the number of trained teachers in a given school category by total number of teachers in that school category, and multiply the result by 100.

**Formula:**

\[
\% TT^t_c = (TT^t_c / T^t_c) \times 100
\]

Where:

- \( \% TT^t_c \) = Percentage of trained teachers in school category \( c \) (primary or upper primary or secondary or higher secondary or all schools) in school-year \( t \).
- \( TT^t_c \) = Number of trained teachers in school category \( c \) in school-year \( t \).
- \( T^t_c \) = Total number of teachers in school category \( c \) in school-year \( t \).

4.6.6 Percentage of Schools Having \( x \) Teachers in a Given School Category

**Definition:** The number of schools of a given category having \( x \) teachers (\( x = 0, 1, 2, \ldots, n \); where \( n \) is maximum number of teachers a school belonging to given category) in position expressed as a percentage of total number of schools in that category.

**Calculation method:** Divide the number of schools of a given category having \( x \) teachers (\( x = 0, 1, 2, \ldots, n \)) in position by total number of schools in that category, and multiply the result by 100.

**Formula:**

\[
\% ST^t_c^x = (ST^t_c^x / S^t_c) \times 100
\]

Where:

- \( \% ST^t_c^x \) = Percentage of schools having \( x \) teachers (\( x = 0, 1, 2, \ldots, n \); where \( n \) is maximum number of teachers in a school belonging to given category) in position in school category \( c \) (primary or upper primary or secondary or higher secondary or all schools) in school-year \( t \).
- \( ST^t_c^x \) = Number of schools having \( x \) teachers in position in school category \( c \) in school-year \( t \).
- \( S^t_c \) = Total number of schools in school category \( c \) in school-year \( t \).

4.6.7 Percentage of Enrolment in Schools Having \( x \) Teachers (\( x = 0, 1, 2, \ldots, n \)) in a Given School Category
**Definition:** Enrolment of schools of a given category having \( x \) teachers (\( x = 0, 1, 2, \ldots, n \)) in position expressed as a percentage of enrolment of all schools of that category.

**Calculation method:** Divide the enrolment of schools of a given category having \( x \) teachers (\( x = 0, 1, 2, \ldots, n \)) in position by total enrolment of all schools of that category, and multiply the result by 100.

**Formula:**

\[
\%E_x^{c,t} = \left( \frac{E_x^{c,t}}{E^{c,t}} \right) \times 100
\]

Where:

- \( \%E_x^{c,t} \) = Percentage of enrolment of schools having \( x \) teachers (\( x = 0, 1, 2, \ldots, n \)) in position in school category \( c \) (primary or upper primary or secondary or higher secondary or all schools) in school-year \( t \).
- \( E_x^{c,t} \) = Enrolment of schools having \( x \) teachers in position in school category \( c \) in school-year \( t \).
- \( E^{c,t} \) = Enrolment of all schools in school category \( c \) in school-year \( t \).

**4.6.8 Pupil-Teacher Ratio**

**Definition:** Average number of pupils (students) per teacher at a specific level of education in a given school-year.

**Calculation method:** Divide the total number of pupils enrolled at the specific level of education by the number of teachers teaching pre-dominantly at that level.

**Formula:**

\[
\text{PTR}^t_h = \left( \frac{E^t_h}{T^t_h} \right)
\]

Where:

- \( \text{PTR}^t_h \) = Pupil-teacher ratio at level of education \( h \) in school-year \( t \).
- \( E^t_h \) = Total number of pupils or (students) at level of education \( h \) in school-year \( t \).
- \( T^t_h \) = Total number of teachers teaching pre-dominantly at level of education \( h \) in school-year \( t \).

**Remark:** A teacher is to be classified according to the stage at which she/he is predominantly teaching, i.e., the stage of education at which maximum time is devoted. If a teacher is teaching at more than one stage of education and devoting equal time at all the stages, then she/he is to be classified at the highest stage at which she/he is teaching.
4.6.9 Percentage of Primary Schools with Pupil-Teacher Ratio (PTR) ≥ x

**Definition:** The number of primary schools having Pupil-Teacher Ratio (PTR) greater than or equal to a given value expressed as a percentage of total number of primary schools in a given school-year.

**Calculation method:** Divide the number of primary schools having PTR greater than or equal to a given value by total number of primary schools in a given school-year, and multiply the result by 100.

**Formula:**
\[
\%\text{PPTR}_x = \left( \frac{\text{PPTR}_x}{\text{TP}} \right) \times 100
\]

Where:
- \(\%\text{PPTR}_x\) = Percentage of primary schools with Pupil-Teacher Ratio (PTR) \(\geq x\) (\(x = 50, 80, 100\) etc.) in school-year \(t\).
- \(\text{PPTR}_x\) = Number of primary schools having PTR \(\geq x\) in school-year \(t\).
- \(\text{TP}\) = Total number of primary schools in school-year \(t\).

4.7 Indicators of Finance

4.7.1 Public Expenditure on Education as a Percentage of Gross National Product

**Definition:** Total public expenditure on education (current and capital) expressed as a percentage of the Gross National Product (GNP) in a given financial year.

**Calculation method:** Divide total public expenditure on education in a given financial year by the GNP of the country for the corresponding year and multiply by 100.

**Formula:**
\[
\%\text{XGNP}_t = \left( \frac{\text{PXE}_t}{\text{GNP}_t} \right) \times 100
\]

Where:
- \(\%\text{XGNP}_t\) = Percentage public expenditure on education in financial year \(t\).
- \(\text{PXE}_t\) = Total public expenditure on education in financial year \(t\).
- \(\text{GNP}_t\) = Gross National Product in financial year \(t\).
4.7.2 Public Expenditure on Education as Percentage of Total Government Expenditure

**Definition:** Total public expenditure on education (current and capital) expressed as a percentage of total government expenditure in a given financial year.

**Calculation method:** Divide total public expenditure on education incurred by all government agencies/departments in a given financial year by the total government expenditure for the same financial year and multiply by 100.

**Formula:**

\[
\%\text{PXE}_t = \left( \frac{\text{PXE}_t}{\text{TPX}_t} \right) \times 100
\]

Where:

- \(\%\text{PXE}_t\) = Public expenditure on education as a percentage of total government expenditure in financial year \(t\).
- \(\text{PXE}_t\) = Total public expenditure on education in financial year \(t\).
- \(\text{TPX}_t\) = Total government expenditure in financial year \(t\).

4.7.3 Percentage Distribution of Public Current Expenditure on Education by Level

**Definition:** Public current expenditure on each level of education, expressed as a percentage of total public current expenditure on education.

**Calculation method:** Divide public current expenditure devoted to each level of education by the total public current expenditure on education, and multiply the result by 100.

**Formula:**

\[
\%\text{PCXE}_{t}^{h} = \left( \frac{\text{PCXE}_{t}^{h}}{\sum_{h=1}^{n} \text{PCXE}_{t}^{h}} \right) \times 100
\]

Where:

- \(\%\text{PCXE}_{t}^{h}\) = Percentage public current expenditures on level of education \(h\) in financial year \(t\).
- \(\text{PCXE}_{t}^{h}\) = Total public current expenditures on level of education \(h\) in financial year \(t\).

4.7.4 Public Current Expenditure per Pupil (Student) as Percentage of GNP per Capita

**Definition:** Public current expenditure per pupil (or student) at each level of education, expressed as a percentage of GNP per capita in a given financial year.
**Calculation method:** Divide per pupil public current expenditure on each level of education in a given year by the GNP per capita for the same year and multiply by 100.

**Formula:**

\[
\% \text{PCXE}_{h,GNPc}^t = \left\{ \left( \frac{\text{PCXE}_{h}^t}{E_{h}^t} \right) \times \left( \frac{\text{GNP}^t}{P^t} \right) \right\} \times 100
\]

Where,

- \( \% \text{PCXE}_{h,GNPc}^t \) = Public current expenditure per pupil of education level \( h \) as percentage of GNP per capita in financial year \( t \).
- \( \text{PCXE}_{h}^t \) = Public current expenditure on education level \( h \) in financial year \( t \).
- \( \text{GNP}^t \) = Gross National Product in financial year \( t \).
- \( E_{h}^t \) = Total enrolment in education level \( h \) in school-year \( t \).
- \( P^t \) = Total national population in year \( t \).

### 4.7.5 Public Current Expenditure on Education as Percentage of Total Public Expenditure on Education

**Definition:** Public current expenditure on education expressed as a percentage of total public expenditure on education (current and capital) in a given financial year.

**Calculation method:** Divide public current expenditure on education in a given financial year by the total public expenditure on education for the same financial year and multiply by 100.

**Formula:**

\[
\% \text{PCXE}_i^t = \left( \frac{\text{PCXE}_i^t}{\text{TPXE}_i^t} \right) \times 100
\]

Where:

- \( \% \text{PCXE}_i^t \) = Percentage public current expenditure on education in financial year \( t \).
- \( \text{PCXE}_i^t \) = Total public current expenditure on education in financial year \( t \).
- \( \text{TPXE}_i^t \) = Total public expenditure on education in financial year \( t \).

### 4.7.6 Teachers’ Emoluments as Percentage of Public Current Expenditure on Education

**Definition:** Public expenditure devoted to teachers’ emoluments expressed as a percentage of total public current expenditure on education.

**Calculation method:** Divide public current expenditure devoted to teachers’ emoluments in a given financial year by the total public current expenditure on education for the same financial year and multiply by 100.
Formula:

\[ \%TX_t = \left( \frac{TX_t}{PCXE_t} \right) \times 100 \]

Where:

\( \%TX_t \) = Percentage of public current expenditure on education devoted to teachers’ emoluments in financial year \( t \).

\( TX_t \) = Total public current expenditure on teachers’ emoluments in financial year \( t \).

\( PCXE_t \) = Total public current expenditure on education in financial year \( t \).

4.8 Indicators of Efficiency

4.8.1 School-life Expectancy

Definition: School life expectancy is defined as the total number of years of schooling which a child of a certain age can expect to receive in the future, assuming that the probability of his or her being enrolled in school at any particular age is equal to the current enrolment ratio for that age.

Calculation method: For a child of a certain age \( a \), the school life expectancy is calculated as the sum of the age specific enrolment ratios for the reference age-range \( a \) to \( n \).

Formula:

\[ SLE_t^i = \sum_{i=a}^{n} \left( \frac{E_t^i}{P_t^i} \right) \]

Where:

\( SLE_t^i \) = School life expectancy at an age \( i \) in year \( t \).

\( E_t^i \) = Enrolment of the population of age \( i \) (for \( i = a, a+1, ..., n \)) in school-year \( t \); \( n \) denotes the theoretical upper age-limit of schooling.

\( P_t^i \) = Population of age \( i \) in school-year \( t \).

4.8.2 Transition Rates

Definition: The number of pupils (or students) admitted to the first grade of a higher level of education in a given year, expressed as a percentage of the number of pupils (or students) enrolled in the final grade of the lower level of education in the previous year.

Calculation method: Divide the number of new entrants in the first grade of the specified higher cycle or level of education by the number of pupils who were enrolled in the final grade of the preceding cycle or level of education in the previous school year, and multiply by 100.
**Formula:**

\[
TR^t_{h,h+1} = \left( E^{t+1}_{h+1,l} - R^{t+1}_{h+1,l} \right) * 100 / E^t_{h,n}
\]

Where:

- \(TR^t_{h,h+1}\) = Transition rate (from cycle or level of education \(h\) to \(h+1\) in school year \(t\)).
- \(E^{t+1}_{h+1,l}\) = Number of pupils enrolled in the first grade at level of education \(h+1\) in school-year \(t+1\).
- \(R^{t+1}_{h+1,l}\) = Number of pupils repeating the first grade at level of education \(h+1\) in school-year \(t+1\).
- \(E^t_{h,n}\) = Number of pupils enrolled in final grade \(n\) at level of education \(h\) in school-year \(t\).

### 4.8.3 Percentage of Repeaters

**Definition:** Total number of pupils who are enrolled in the same grade as in a previous year, expressed as a percentage of the total enrolment to the specified grade.

**Calculation Method:** Divide the number of pupils/students repeating a given grade in a given school-year by the number of pupils or students enrolled in the same grade in the same school-year and multiply by 100.

**Formula:**

\[
PR^t_i = \left( R^t_i / E^t_i \right) * 100
\]

Where:

- \(PR^t_i\) = Percentage of repeaters in grade \(i\), in school-year \(t\).
- \(R^t_i\) = Number of pupils repeating in grade \(i\), in school-year \(t\).
- \(E^t_i\) = Number of pupils enrolled in grade \(i\), in school-year \(t\).

### 4.8.4 Repetition Rates

**Definition:** Proportion of pupils from a cohort enrolled in a given grade at a given school-year who study in the same grade in the following school-year.

**Calculation Method:** Divide the number of repeaters in a given grade in school-year \(t+1\) by the number of pupils from the same cohort enrolled in the same grade in the previous school-year \(t\).

**Formula:**

\[
r^t_i = \left( R^{t+1}_i / E^t_i \right)
\]
Where:

\[ r_{i}^{t} = \text{Repetition Rate at grade } i \text{ in school-year } t. \]
\[ R_{i}^{t+1} = \text{Number of pupils repeating grade } i \text{ in school-year } t+1. \]
\[ E_{i}^{t} = \text{Number of pupils enrolled in grade } i \text{ in school-year } t. \]

### 4.8.5 Survival Rates by Grade

**Definition:** Percentage of a cohort of pupils (or students) enrolled in the first grade of a given level or cycle of education in a given school-year who are expected to reach successive grades.

**Calculation method:** Divide the total number of pupils belonging to a school-cohort who reached each successive grade of the specified level of education by the number of pupils in the school cohort, i.e., those originally enrolled in the first grade of primary education, and multiply the result by 100.

**Formula:**

\[
SR_{g,i}^{k} = \left( \sum_{t=1}^{m} \frac{P_{g,i}^{t}}{E_{g}^{k}} \right) \times 100
\]

Where:

\[ P_{g,i}^{t} = E_{g,i+1}^{t} - R_{g,i+1}^{t} \]

\[ i = \text{grade (1, 2, 3, …, n)} \]
\[ t = \text{year (1, 2, 3, …, m)} \]
\[ g = \text{pupil-cohort}. \]

**SR_{g,i}^{k} = Survival Rate of pupil-cohort } g \text{ at grade } i \text{ for a reference year } k.\]
\[ E_{g}^{k} = \text{Total number of pupils belonging to a cohort } g \text{ at a reference year } k. \]
\[ P_{g,i}^{t} = \text{Promotes from } E_{g}^{k} \text{ who would join successive grades } i \text{ throughout successive years } t. \]
\[ R_{i}^{t} = \text{Numbers of pupils repeating grade } i \text{ in school-year } t. \]

### 4.8.6 Coefficient of Efficiency

**Definition:** The ideal (optimal) number of pupil-years required (i.e. in the absence of repetition and drop-out) to produce a number of graduates from a given school-cohort for a cycle or level of education expressed as a percentage of the actual number of pupil-years spent to produce the same number of graduates. Input-output ratio, which is the reciprocal of the coefficient of efficiency, is often used as an alternative.

**Calculation method:** Divide the ideal number of pupil-years required to produce a number of graduates from a given school-cohort for the specified level of education, by the actual number of pupils-years spent to produce the same number of graduates, and multiply the result by 100.

N.B.: One school-year spent in a grade by a pupil is counted as one pupil-year.
Formula:

\[ CE_g = \left[ \sum_{j=n}^{n+k} G_{g,j} \times n \right] / \left( \sum_{j=n}^{n+k} G_{g,j} \times j \right) + \left\{ \sum_{j=1}^{n+k} D_{g,j} \times j \right\} \times 100 \]

Where:

- \( CE_g \) = Coefficient of Efficiency for a pupil-cohort \( g \).
- \( G_{g,n} \) = Number of pupils graduating from cohort \( g \) in final grade \( n \) after \( n \) years of study (without repetition).
- \( G_{g,j} \) = Number of pupils graduating from cohort \( g \) in final grade \( n \) after \( j \) years of study.
- \( D_{g,j} \) = Number of pupils (of the cohort \( g \)) dropping out after \( j \) years of study.
- \( k \) denotes the number of repetitions allowed, \( n \) the prescribed normal duration of study for a cycle or level of education, \( g \) the pupil-cohort; and \( j \) the number of years of study.

### 4.8.7 Years-Input per Graduate

**Definition:** The estimated average number of pupil-years spent by pupils (or students) from a given cohort who graduate from a given cycle or level of education, taking into account the pupil-years wasted due to drop-out and repetition.

N.B.: One school-year spent in a grade by a pupil is equal to one pupil-year.

**Calculation Method:** Divide the total number of pupil-years spent by a pupil-cohort (graduates plus drop-outs) in the specified level of education by the sum of successive batch of graduates belonging to the same cohort.

**Formula:**

\[ YIG_g = \left[ \left\{ \sum_{j=n}^{n+k} G_{g,j} \times j \right\} + \left\{ \sum_{j=1}^{n+k} D_{g,j} \times j \right\} \right] / \sum_{j=n}^{n+k} G_{g,j} \]

Where:

- \( YIG_g \) = Years input per graduate (for graduates belonging to cohort \( g \)).
- \( G_{g,j} \) = Graduates from cohort \( g \) after \( j \) years of study.
- \( D_{g,j} \) = Drop-outs from cohort \( g \) after \( j \) years of study.

\( k \) denotes the number of repetitions allowed; \( n \) the prescribed normal duration of study for a cycle or level of education; \( g \) the pupil-cohort; and \( j \) the number of years of study.
4.8.8 Percentage of Underage and Overage Children at Primary Stage (Classes I-V)

**Definition:** The enrolment of primary stage (Classes I-V) not belonging to the age group that officially corresponds to primary stage (Classes I-V) expressed as a percentage of total enrolment of primary stage (Classes I-V) in a given school-year.

**Calculation method:** Divide the enrolment of primary stage (Classes I-V) not belonging to the age group that officially corresponds to primary stage (Classes I-V) by the total enrolment of primary stage (Classes I-V) in a given school-year, and multiply by 100.

**Formula:**

\[ \%UOC_t^p = \frac{(E_t^p \notin a)}{E_t^p} \times 100 \]

Where:

- \( \%UOC_t^p \) = Percentage of underage and overage children at primary stage (Classes I-V) in school-year \( t \).
- \( E_t^p \) = Enrolment of primary stage (Classes I-V) in school-year \( t \).
- \( a \) = Age group that officially corresponds to primary stage (Classes I-V).

4.8.9 Percentage of Government and Local Body Primary Schools in Total Primary Schools (Excluding Private Unaided)

**Definition:** The number of Government and local body primary schools expressed as a percentage of total number of primary schools (excluding private unaided).

**Calculation method:** Divide the number of Government and local body primary schools by total number of primary schools (excluding private unaided), and multiply by 100.

**Formula:**

\[ \%GLP = \frac{(G + L)}{T} \times 100 \]

Where:

- \( \%GLP \) = Percentage of Government and local body primary schools in total primary schools (excluding private unaided).
- \( G \) = Number of Government primary schools.
- \( L \) = Number of Local Body primary schools.
- \( T \) = Total number of primary schools (excluding private unaided).

4.8.10 Percentage Teaching Staff in Private Educational Institutions

**Definition:** Number of teachers in private educational institutions at a given level of education expressed as a percentage of the total teaching staff in all types of institutions at the same level of education. By ‘Private’ is meant here all educational institutions not operated by a public authority, whether or not they receive financial support from such authorities.
Calculation method: Divide the number of teachers in private educational institutions in a given level of education by the total number of teachers (in both public and private educational institutions) at the same level, and multiply the result by 100.

Formula:

\[
\%\text{Tp}_h^t = \left( \frac{\text{Tp}_h^t}{\text{T}_h^t} \right) \times 100
\]

Where:

\(\%\text{Tp}_h^t\) = Percentage of teaching staff in private institutions at the level of education \(h\) in school-year \(t\).

\(\text{Tp}_h^t\) = Teaching staff in private institutions at the level of education \(h\) in school-year \(t\).

\(\text{T}_h^t\) = Total number of teachers (in public and private educational institutions) at the level of education \(h\) in school-year \(t\).