



Key indicators on tertiary education : calculation and interpretation

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Overview

- **Input indicators:** teaching staff, education expenditure
- **Access/participation indicators:** enrolment, mobile students
- **Output indicators:** completion, graduates, attainment
- **Other indicators:**
 1. School Life Expectancy
 2. Gender Parity Index
 3. Human Development Index

Input indicators

- Teaching staff
- Expenditure on Education
 - Public expenditure on higher education
 - As percent of total government expenditures
 - As percent of total government expenditures on education
 - Public expenditures per student



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Teaching staff

- Total number of teachers
- Percentage of female tertiary teachers
- Number of teachers by ISCED 5A, 5B and 6

TERTIARY EDUCATION (ISCED97 levels 5 and 6)

Table 2:

Teaching staff by type of programme (public and private)

ISCED97 level	Type of programme	Full- and part-time		
		Both sexes	Female	Bot
5A	First stage (leading to entry into advanced research programmes)			
5B	First stage (not leading to entry into advanced research programmes)			
6	Second stage (leading to an advanced research qualification)			
5+6	TOTAL			



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Expenditure

- Public expenditure on higher education
 - As percent of total government expenditures
 - As percent of total government expenditures on education
- Public expenditures per student



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Public expenditure on higher education as a percentage of total government expenditures

Formula: $100 \times \frac{\text{Current and capital expenditure on tertiary education by local, regional and federal governments, including municipalities (household contributions are excluded)}}{\text{total government expenditure on all sectors (including health, education, social services, etc.)}}$

TOTAL GOVERNMENT EXPENDITURE FROM ALL SECTORS (including education)*

Table 3:

PUBLIC ADMINISTRATIONS	Current	Capital	TOTAL
1. Central (federal) government			
2. Regional (or state) government			
3. Local governments			
4. Total government expenditure from all sectors (including education) (net of intergovernmental transfer)			

Table 1 (continued):

I. Public sources

EXPENDITURE BY SOURCES OF FUNDS	Tertiary ISCED 5B	Tertiary ISCED 5A+6	TOTAL tertiary ISCED 5+6	Expenditure not allocated	TOTAL all levels
G20. Total government expenditure (G5+G14+G15)*					
→ of which: G5a. Capital expenditure					
→ of which: G5b. Current expenditure					

Public expenditure on higher education as a percentage of total public (government) expenditure on education

Formula: $100 \times \frac{\text{Current and capital expenditure on tertiary education by local, regional and national governments, including municipalities (household contributions are excluded)}}{\text{total public (government) expenditure on education sector}}$

Table 1 (continued):

I. Public sources

EXPENDITURE BY SOURCES OF FUNDS	Tertiary ISCED 5B	Tertiary ISCED 5A+6	TOTAL tertiary ISCED 5+6	Expenditure not allocated	TOTAL all levels
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Public expenditures per student

Formula:
 [Total public expenditure in tertiary] / [total number of student]

Table 3:
 Students enrolled by type of programme (public and private)

ISCED07 level	Type of programme	STUDENTS ENROLLED				
		Full- and part-time		Part-time only		Full-time equivalent number of students
		Both sexes	Female	Both sexes	Female	Both sexes
5A	First stage (leading to entry into advanced research programmes)					
5B	First stage (not leading to entry into advanced research programmes)					
6	Second stage (leading to an advanced research qualification)					
5+6	TOTAL					
of which students enrolled in:						
5+6	Public institutions					
	Government-dependent private institutions					
	Independent private institutions					

Table 1 (continued):
 I. Public sources

EXPENDITURE BY SOURCES OF FUNDS	Tertiary ISCED 5B	Tertiary ISCED 5A+6	TOTAL tertiary ISCED 5+6	Expenditure not allocated	TOTAL all levels
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→ of which: G5a. Capital expenditure					
→ of which: G5b. Current expenditure					

Access/Participation indicators

Enrolment

- Gross entry ratio
- Gross enrolment ratio (GER)
- Tertiary students per 100,000 pop
- Students by broad fields of education
- Distribution of students by ISCED level



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Gross entry ratio

Formula: $100 \times \frac{\text{Total number of new entrants to a given group of programmes (ISCED 5A, 5B, 6) regardless of age}}{\text{Population of theoretical entrance age to those programmes}}$

Gross enrolment ratio (GER)

$$\text{GER} = 100 \times \left[\frac{\text{Tertiary enrolment}}{\text{Five-year age cohort following theoretical age of secondary education completion}} \right]$$

Table 3:

Students enrolled by type of programme (public and private)

ISCED97 level	Type of programme	STUDENTS ENROLLED				
		Full- and part-time		Part-time only		Full-time equivalent number of students
		Both sexes	Female	Both sexes	Female	Both sexes
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5+6	TOTAL					
of which students enrolled in:						
5+6	Public institutions					
	Government-dependent private institutions					
	Independent private institutions					



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Tertiary students per 100,000 inhabitants

Formula: $100,000 \times (\text{Total number of students enrolled in tertiary education in a given academic-year} / \text{the country's population})$

A high number of students per 100,000 inhabitants indicates a generally high level of participation in tertiary education in relation to a country's population.

Students by broad fields of education (in %)

Formula: $100 \times (\text{Number of students enrolled in each field of education} / \text{total enrolment in tertiary education in a specific academic-year})$

Relative concentration of students in particular fields of education depicts on the one hand high preference and capacity, and on the other hand may reflect job opportunities as well as relative earnings across different occupations and industries.

Table 6:
Enrolment by fields of education, cumulative duration and national degree structure (full-time and part-time, public and private)

Fields of education	ISCED 5A First stage (leading to entry to advanced research programmes)					TOTAL ISCED 5A+5B+6	
	Less than 3 years		3 years or more		Both sexes	Female	
	Both sexes	Female	Both sexes	Female			
General programmes							
04 Basic programmes							
Education							
141 Teacher training							
142 Education sciences							
Humanities and arts							
21 Arts							
22 Humanities							
Social sciences, business and law							
31 Social and behavioural sciences							
32 Commerce and administration							
33 Business and administration							
34 Law							
Sciences							
41 Life sciences							
42 Physical sciences							
43 Mathematics and statistics							
44 Computing							
Engineering, manufacturing and construction							
51 Engineering and engineering technologies							
54 Manufacturing and processing							
55 Architecture and building							
Agriculture							
61 Agriculture, forestry and fishery							
62 Forestry							
Health and welfare							
71 Health							
72 Social services							
Services							
81 Personal services							
82 Transport services							
83 Environmental protection							
84 Security services							
Not known or unspecified							
91 Not known or unspecified							
TOTAL							

Students by field of education (9 broad fields)

Broad fields of education

1. Science and technology
 - a. Science
 - b. Engineering, manufacturing and construction
2. Other fields
 - a. Education
 - b. Humanities and Arts
 - c. Social sciences, business and law
 - d. Agriculture
 - e. Health and welfare
 - f. Services



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Distribution of students by ISCED level (in %)

Formula: $100 \times [\text{number of students in each tertiary ISCED level}] / [\text{total enrolment in tertiary education in a given academic year}]$

The relative concentration of students in particular programmes (long/short programmes) or levels is likely to be driven by job opportunities related to those levels. It also reflects capacities and policies for the development of a particular ISCED level.

Table 3:

Students enrolled by type of programme (public and private)

ISCED97 level	Type of programme	STUDENTS ENROLLED				
		Full- and part-time		Part-time only		Full-time equivalent number of students- Both sexes
		Both sexes	Female	Both sexes	Female	
5A	First stage (leading to entry into advanced research programmes)					
5B	First stage (not leading to entry into advanced research programmes)					
6	Second stage (leading to an advanced research qualification)					
5+6	TOTAL					

of which students enrolled in:

5+6	Public institutions					
	Government-dependent private institutions					
	Independent private institutions					

Access/Participation indicators (cont'd)

Mobile students

- Inbound mobile students
 - Inbound mobility rate
- Outbound mobile students
 - Outbound mobility ratio
- Net flow of mobile students
 - Net flow ratio



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Inbound mobility rate

Inbound mobility rate = $100 \times$
 [Total number of students from abroad
 studying in a given country (inbound
 students)] / [Total tertiary enrolment in
 that country]

TERTIARY EDUCATION (ISCED97 levels 5 and 6)

Table 7:

International (or internationally mobile) students by country of origin (public and private)

	COUNTRY OF ORIGIN	Number of international students (both sexes)		COUNTRY OF ORIGIN	Number of international students (both sexes)
TOTAL NUMBER OF STUDENTS ENROLLED IN TERTIARY EDUCATION (national and international)		Both sexes			
		Female			
→ of which INTERNATIONAL STUDENTS		Both sexes			
		Female			

If data for international students are partial, please explain why.

Outbound mobility ratio

Outbound mobility ratio = $100 \times$
[Total number of students from a
given country studying abroad
(outbound students)] / [Total tertiary
enrolment in that country]



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Net flow ratio

Net flow ratio = 100 x
[[Total number of tertiary students from
Abroad studying in a given country
(inbound students)] - [Number of students
at the same level of education from that
country studying abroad (outbound
students)]] / [Total tertiary enrolment in
that country]



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Output indicators

- Completion (**graduation ratio**)
- Graduates
 - **Gross graduation ratio** (first degree)
 - Graduates by field of education
- Attainment (% individuals with tertiary education)



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Gross graduation ratio at tertiary

Gross tertiary graduation ratio =
 $100 \times [\text{Number of graduates in a given level or programme (first degree), regardless of age}] / [\text{Population at the theoretical graduation age for that level or programme during the same academic year}]$

A high ratio indicates a high degree of current tertiary education outputs

TERTIARY EDUCATION (ISCED97 levels 5 and 6)

Table 6:

Graduates by fields of education, cumulative duration and national degree structure (public and private)

Fields of education	TOTAL ISCED 5A		ISCED 5B		ISCED 6		TOTAL ISCED 5A+5B+6	
			First stage (not leading to entry to advanced research programmes)		Second stage (leading to advanced research qualification)			
	Both sexes	Female	Both sexes	Female	Both sexes	Female	Both sexes	Female
TOTAL								

Graduates by field of education

Graduates by field of education =
 $100 \times [\text{Number of graduates from each field of education in tertiary education}] / [\text{Total number of graduates in tertiary education}]$

Relative concentration of graduates in particular fields of education depicts high preference and capacity in these programmes as well as related job opportunities.

Attainment (% individuals with tertiary education)

Formula: $100 \times \frac{\text{Number of persons aged 25 years and above who attain tertiary education level}}{\text{Total population of the same age group}}$

A relative high concentration of the 25+ population at tertiary level reflects the capacity of the educational system in that level of education.

Educational attainment is closely related to the skills and competencies of a country's population, and could be seen as a proxy of both the quantitative and qualitative aspects of the stock of human capital.

Other indicators

- School Life Expectancy
- Gender Parity Index
- Human Development Index



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School life expectancy

Definition: 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.

SLE from primary to tertiary is the sum of enrolment ratios by age from primary to tertiary.

SLE for tertiary education is the sum of enrolment ratios by age at tertiary education.

The part of the enrolment that is not distributed by age is divided by the school-age population for the level of education they are enrolled in, and multiplied by the duration of that level of education. The result is then added to the sum of the age-specific enrolment rates.



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School life expectancy (cont'd)

Example:

SLE from primary to tertiary = 9.8 years

SLE at tertiary = 0.34 year

Ages (1)	Enrolment				Population (3)	Age specific enrolment ratios = [(2) / (3)]	
	Primary	Secondary	Tertiary	Total (2)			
5	144868			144868	2426540	0.06	
6	196148			196148	2368269	0.08	
7	2061840			2061840	2316156	0.89	
8	1885733			1885733	2268754	0.83	
9	1742433			1742433	2024618	0.86	
10	1620536			1620536	1783828	0.91	
11	1519361	15958		1535319	1646464	0.93	
12	1400307	96620		1496927	1601449	0.93	
13	1038409	243342		1281751	1550286	0.83	
14	671604	571189		1242793	1540106	0.81	
15	410085	650637		1060722	1501430	0.71	
16	204532	625850		830382	1473621	0.56	
17	253203	583253		836456	1411189	0.59	
18		291369	45881	337250	1342601	0.25	0.03
19		145108	69226	214334	1270362	0.17	0.05
20		76515	76558	153073	1198669	0.13	0.06
21		67292	88775	156067	1126876	0.14	0.08
22		2456	65992	68448	1058705	0.06	0.06
23		198	34556	34754	1034776	0.03	0.03
24		5	3566	3571	1011879	0.00	0.00
25			3100	3100	987523	0.00	0.00
26			1740	1740	932445	0.00	0.00
27			985	985	873045	0.00	0.00
28			681	681	874983	0.00	0.00
29			290	290	865543	0.00	0.00
30-34			456	456	4322237	0.00	0.00
35-39					3056678	0.00	0.00
39+					9130986	0.00	0.00
Age unknown						0.00	0.00
Total	13149059	3369792	391806	16910657	53000018	9.8	0.34



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Gender Parity Index (GPI) in tertiary education

$$\text{Formula for GER: } 100 \times \frac{[\text{GER in higher education for females}]}{[\text{GER in higher education for males}]}$$

A GPI equal to 1 indicates parity between females and males. In general, a value less than 1 indicates disparity in favour of boys/men and a value greater than 1 indicates disparity in favour of girls/women.

Human Development Index (HDI)

- Composite statistics used to rank countries by level of 'human development' and separate developed, developing and underdeveloped countries.
- Measures the average achievement at the country level in 3 dimensions:
 1. Life expectancy at birth: measure of health and longevity;
 2. Knowledge and education: measured by literacy rate for individuals aged 15+ (with a weight = 2/3) and combined primary, secondary and **tertiary** GER (weight = 1/3);
 3. Standard of living: measured by the average of GDP per capita at purchasing power parity.

Each dimension represents 1/3 of the average.

Future steps to better monitor trends in tertiary education

- Produce and publish measures of educational attainment
- Revise data collection to include:
 - Secondary graduation rates (for programmes which provide access or not to tertiary education)
 - Intake into tertiary education
- Improve meta-data (more detailed ISCED mappings of national systems)
- Apply new fields of study classification

Final remarks

- Growing attention to developments of tertiary sector
- Need relevant and reliable indicators to monitor trends in tertiary education (MDGs, AU)
- Need timely and quality data



Thank you!