

UIS Survey on Statistics of Information and Communication Technology (ICT) in Education

Regional workshop for Latin America and the Hispanic Caribbean
 Sao Paulo, Brazil, 17-18 November 2016

Outline

Module 2

- ❖ Global survey on ICT in education
 - ✓ Policy and Curriculum
 - ✓ Educational Institutions & ICT infrastructure
 - ✓ Enrolment
 - ✓ Computers allocated to schools
 - ✓ Teaching staff and ICT

How to measure ICT4E

To remember...

Coverage

Includes All programmes

General + technical and vocational education and training (TVET)

Excludes

Adult Education

Primary and
secondary

(ISCED 1- 3)



ISCED 2011

Public &
private (Total)

Public only

The questionnaire

Data codes

Z – Category not applicable (previously denoted as ‘a’)

- ❖ If a data item or table refers to a category which does not apply or exist in your national education system, please leave the numeric data cell blank and enter 'Z' in the related codes cell. The use of this code indicates that data for these categories do not even hypothetically exist.

X – Data included elsewhere

- ❖ If a data item or category exists in your national education system but cannot be disaggregated from another category, please leave the numeric data cell blank and enter 'X' in related codes cell. Please also indicate in the comment cell, in which cell data are included, by using the Excel column and row identifiers or free text. Where appropriate, please also use the code 'W' described below.

The correct use of codes is an essential condition to ensure cross-national comparability and completeness of data – **NO blank cells!**

The questionnaire

Data codes

W – Includes data from another category (new code)

- ❖ If data include other categories (e.g. primary data also include pre-primary data) and are therefore over-covered, please enter the value in the numeric data cell and 'W' in the related codes cell. Please also indicate in the comment cell which data are included by using the Excel column and row identifiers or free text. Where appropriate, please also use the 'X' code described above.

M – Data not available or missing

- ❖ If a category exists in your national education system but the related data are not available, cannot be estimated and are not included in any other cells of the questionnaire, please leave the numeric data cell blank and enter 'M' in the related codes cell. In such cases, please note that the total is considered to be missing or incomplete with respect to these categories. If possible, please provide a comment to indicate why data are not available.

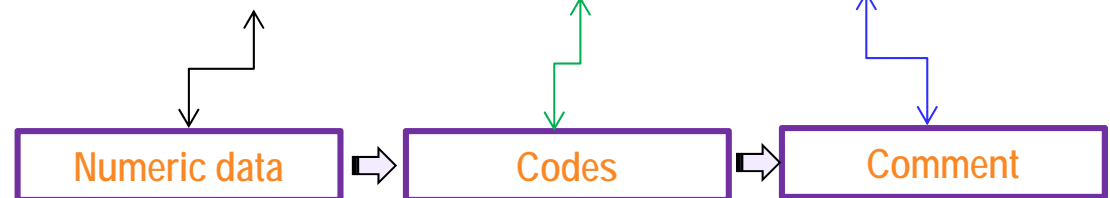
****Provisional or estimated data should be included**

Structure of data items

To remember...

- ❖ Each data item is composed of three distinct cells

Schools		Primary (ISCED 1)	Lower secondary (ISCED 2)	Upper secondary (ISCED 3)	Total primary and secondary schools
Total number of schools		5,006.000	3,250.000 W	Including ISCED 3 data (R8 X) Included	8,256.000
Electricity		5,006.000	3,250.000 W	Including ISCED 3 data (R8 X) Included	8,256.000

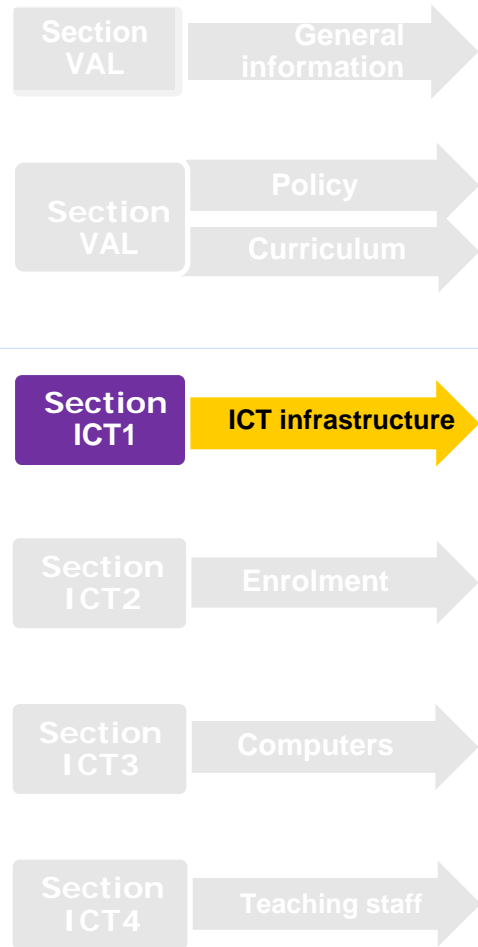


- ❖ Numeric data: cells only accept numeric values, including zeros (to indicate nil or negligible data)
- ❖ Contains validation checks using conditional formatting to highlight errors or invalid data entries
- ❖ Celdas sólo aceptan las letras Z, X, W o M

The questionnaire

Structure

ICT1: ICT infrastructure in schools by level of education - all programmes (general and vocational)



Schools		Primary (ISCED 1)	Lower secondary (ISCED 2)	Upper secondary (ISCED 3)	Total primary and secondary schools		
All schools	Total number of schools						
	With:	Electricity					
		Telephone communication facility					
		Internet					
		Of which:	Fixed narrowband Internet				
			Fixed broadband Internet				
			Mobile broadband Internet				
		Radio(s) for teaching and learning					
		Television(s) for teaching and learning					
		Computer(s) for teaching and learning					
		Located in:	Computer laboratories				
			Classrooms				
			Libraries				
		Local Area Network (LAN)					
		Internet for teaching and learning					
		Open Educational Resources (OER)					
		Institutional website					
ICT support services							
Public schools only	Total number of schools						
	With:	Electricity					
		Telephone communication facility					
		Internet					
		Of which:	Fixed narrowband Internet				
			Fixed broadband Internet				
			Mobile broadband Internet				
		Radio(s) for teaching and learning					
		Television(s) for teaching and learning					
		Computer(s) for teaching and learning					
		Located in:	Computer laboratories				
			Classrooms				
			Libraries				
		Local Area Network (LAN)					
		Internet for teaching and learning					
		Open Educational Resources (OER)					
		Institutional website					
ICT support services							

Section ICT1: ICT infrastructure in schools

Instructions:

- ❖ All programmes (general and vocational)
- ❖ **Double counting** instructional educational institutions at **ISCED programme level is permitted** since an educational institution may offer two or more programmes that span more than one ISCED level.
 - ❖ For example, if an educational institution offers both ISCED level 2 and 3 programmes, it **must be counted once under ISCED level 2 and once under ISCED level 3**.
- ❖ Primary and secondary organizational units refer to the total of all educational institutions regardless of the number of ISCED level 1 to 3 programmes they offer

Section ICT1: ICT infrastructure in schools

Double counting

Types of schools	Total
Primary schools	<u>20</u>
Lower secondary schools	5
Upper secondary schools	10
Combined primary and lower secondary schools	<u>5</u>
Combined secondary schools	2
Combined primary and secondary schools	<u>3</u>
Total Schools	45

By double counting, the following numbers are obtained

	Primary	Lower secondary	Upper secondary	Total Schools
Schools	28	15	15	45

Total schools- organizational units

Section ICT1: ICT infrastructure in schools

In this country, lower and upper secondary schools are in the same schools!

Schools		Primary (ISCED 1)	Lower secondary (ISCED 2)	Upper secondary (ISCED 3)	Total primary and secondary schools	
All schools	Total number of schools	100.000	50.000	50.000	150.000	
	With:	Electricity	50.000	50.000	50.000	100.000
		Telephone communication facility	35.000	40.000	40.000	75.000
		Internet	30.000	38.000	38.000	68.000
	Of which:	Fixed narrowband Internet	5.000	3.000	3.000	8.000
		Fixed broadband Internet	25.000	15.000	15.000	40.000
Mobile broadband Internet		0.000	20.000	20.000	20.000	

 Figures in the last column are not necessarily the total sums of columns for primary and secondary (ISCED 1-3); they represent “bricks and mortar” educational institutions and therefore are **not double counted**.

Section ICT1: ICT infrastructure in schools

NOT double counted



Schools		Primary (ISCED 1)	Lower secondary (ISCED 2)	Upper secondary (ISCED 3)	Total primary and secondary schools		
All schools	Total number of schools	100.000	75.000	50.000	178.000		
	With:	Electricity	50.000	60.000	50.000	80.000	
		Telephone communication facility	35.000	50.000	40.000	55.000	
		Internet	30.000	42.000	38.000	75.000	
		Of which:	Fixed narrowband Internet	5.000	15.000	10.000	12.000
			Fixed broadband Internet	25.000	55.000	30.000	60.000
			Mobile broadband Internet	0.000	20.000	20.000	25.000
		Radio(s) for teaching and learning	10.000	30.000	25.000	32.000	
		Television(s) for teaching and learning	35.000				
		Computer(s) for teaching and learning	35.000	50.000	40.000	55.000	
		Located in:	Computer laboratories	5.000	15.000	10.000	15.000
			Classrooms	0.000	0.000	0.000	0.000
			Libraries	2.000	5.000	5.000	5.000
		Local Area Network (LAN)	5.000	15.000	10.000	15.000	
		Internet for teaching and learning	5.000	15.000	10.000	15.000	
		Open Educational Resources (OER)	0.000	0.000	0.000	0.000	
Institutional website	2.000	5.000	5.000	7.000			
ICT support services	35.000	50.000	40.000	55.000			

Double counted

To remember...

ICT IN EDUCATION refers to education models that employ ICT to support, enhance and enable the delivery of education. Any, all or combinations of the following types of ICTs are included.



Concepts and Definitions

Survey previously asked for data on number of institutions with the following:

- ❖ Radio-assisted instruction (RAI)
- ❖ Television-assisted instruction (TAI)
- ❖ Computer-assisted instruction (CAI)
- ❖ Internet-assisted instruction (IAI)

However due to confusion, survey now asks for data on the number of institutions with the following for teaching and learning:

- ❖ Radio(s)
- ❖ Television(s)
- ❖ Computer(s)
- ❖ Internet

Concepts and Definitions



INSTRUCTIONAL EDUCATIONAL INSTITUTION

Institution that provides education as its main purpose, such as a school, college, university or training centre. Such institutions are normally accredited or sanctioned by the relevant national education authorities or equivalent authorities. Educational institutions may also be operated by private organizations, such as religious bodies, special interest groups or private educational and training enterprises, both for profit and non-profit.

Concepts and Definitions



PUBLIC INSTRUCTIONAL EDUCATIONAL INSTITUTION

Institution that is controlled and managed directly by a public education authority or agency of the country where it is located or by a government agency directly or by a governing body (council, committee etc.), most of whose members are either appointed by a public authority of the country where it is located or elected by public franchise.

PRIVATE INSTRUCTIONAL EDUCATIONAL INSTITUTION

Institution that is controlled and managed by a non-governmental organization (e.g. a church, a trade union or a business enterprise, foreign or international agency), or its governing board consists mostly of members who have not been selected by a public agency.

Concepts and Definitions



ELECTRICITY

Refers to regularly and readily available sources of power (e.g. grid/mains connection, wind, water, solar and fuel-powered generator, etc.) that enable the adequate and sustainable use of ICT infrastructure for educational purposes.

TELEPHONE COMMUNICATION FACILITY

Refers to fixed telephone lines, cable connections (i.e. cable telephony) or other sustainable communication technology that connects an educational institution's terminal equipment (e.g. telephone set, facsimile machine) to the public switched telephone network (PSTN) and has a dedicated port on a telephone exchange. Access is defined by a subscription to services that allow the physical presence and use of the facilities in a given educational institution. A mobile cellular phone owned by an individual working at a school does not constitute a school telephone communication facility.

Concepts and Definitions



INTERNET

The Internet is a worldwide interconnected computer network. It provides access to a number of communication services including the World Wide Web and carries e-mail, news, entertainment and data files, irrespective of the device used (i.e. not assumed to be only via a computer) and thus can also be accessed by mobile telephone, tablet, PDA, games machine, digital TV etc.

Concepts and Definitions



Access can be via a fixed or mobile network and include the following:

- ✓ **Fixed narrowband** Internet includes analogue modem (dial-up via standard phone line), ISDN (Integrated Services Digital Network), DSL (Digital Subscriber Line) at advertised download speeds below 256kbit/s (kilobits per second), and other forms of access with an advertised download speed of less than 256 Kbit/s;
- ✓ **Fixed broadband** Internet refers to technologies at advertised download speeds of at least 256 Kbit/s such as DSL, cable modem, high speed leased lines, fibre-to-the-home/ building, powerline and other fixed broadband including terrestrial fixed broadband network such as WiMAX and fixed CDMA, and satellite broadband network (via a satellite connection); and
- ✓ **Mobile broadband** Internet includes technologies at least 3G, e.g. UMTS via a handset or via a card (e.g. integrated SIM card in a computer) or USB modem; mobile broadband via privately-owned mobile phone networks is excluded.

Concepts and Definitions



RADIO

A device (in working condition) capable of receiving broadcast radio signals, using popular frequencies (such as FM, AM, LW and SW). A radio may be a stand-alone device, or it may be integrated with another device, such as an alarm clock or an audio CD player.

Computers and mobile telephones used to stream radio broadcasts using popular frequencies such as FM, AM, LM and SW should be **excluded** since they also provide many more forms of communication.

Concepts and Definitions



RADIOS FOR TEACHING AND LEARNING

Includes both radio broadcast education and interactive radio instruction. Radio broadcast education entails an audio lecture or lesson, with printed material for pupils to follow the lecture. Any teacher, not necessarily qualified in the subject matter, can use the radio programme as a main instructional source. Broadcast programmes follow the traditional model of education and can cover every subject in many different languages, depending on the target audience.

Interactive radio instruction (IRI) turns a typically one-way technology into a tool for active learning inside and outside the classroom. It requires that pupils react to questions and exercises through verbal responses to radio programme contributors, group work, and physical and intellectual activities while the programme is on air. For both teacher and pupil, the lesson becomes an immediate hands-on practical guide.

The use of audio cassettes or CDs, which lessens much of the rigidity of a broadcast, may also form the basis of radio-assisted instruction.

Concepts and Definitions



TELEVISIONS FOR TEACHING AND LEARNING

Is similar to radio broadcast education, with the additional benefit of video. Television broadcasts helps to bring abstract concepts to life through clips, animations, simulations, visual effects and dramatization. It can also connect a classroom to the world but may share the same rigid scheduling and lack of interactivity as radio broadcast education. The use of video-cassettes or DVD's, which lessens much of the rigidity of a broadcast, may also form the basis of television-assisted instruction.

TELEVISION (TV) SET

A stand-alone device (in working condition) capable of receiving broadcast television signals, using popular access means such as over-the-air, cable and satellite.

Computers and mobile telephones used to stream TV broadcasts should be excluded since they also provide many more forms of communication.

Concepts and Definitions



COMPUTER

A programmable electronic device that can store, retrieve and process data, as well as share information in a highly-structured manner. It performs high-speed mathematical or logical operations according to a set of instructions or algorithms. Computers include the following types:

- ✓ A **desktop computer** usually remains fixed in one place; normally the user is placed in front of it, behind the keyboard;
- ✓ A **laptop computer** is small enough to carry and usually enables the same tasks as a desktop computer; it includes notebooks and netbooks but does not include tablets and similar handheld devices; and
- ✓ A **tablet** (or similar handheld computer) is a computer that is integrated into a flat touch screen, operated by touching the screen rather than using a physical keyboard.

Concepts and Definitions



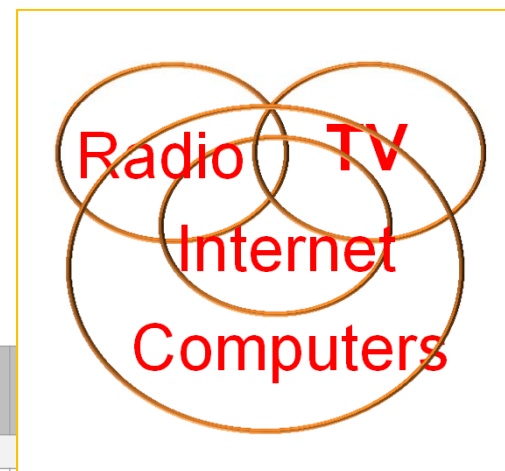
COMPUTERS FOR TEACHING AND LEARNING

Computers used by pupils and teachers to support course delivery or independent teaching and learning needs. This may include activities using computers or the Internet to meet information needs for research purposes, develop presentations, perform hands-on exercises and experiments, share information, and participate in online discussion forums for educational purposes.

Section ICT1: ICT infrastructure in schools

Completing the questionnaire:

Categories are NOT mutually exclusive



Schools		Primary (ISCED 1)	Lower secondary (ISCED 2)								
All schools	Total number of schools	300.000	250.000	150.000	700.000						
	With:	Electricity	280.000	250.000	150.000	680.000					
		Telephone communication facility	240.000	250.000	150.000	640.000					
		Internet	150.000	150.000	130.000	430.000					
		Of which:	Fixed narrowband Internet	100.000	120.000	0.000	220.000	Nil value			
			Fixed broadband Internet	50.000	0.000	0.000	50.000	Nil at IS			
			Mobile broadband Internet	0.000	30.000	130.000	160.000	Nil value			
		Radio(s) for teaching and learning	250.000	230.000	140.000	620.000					
		Television(s) for teaching and learning	250.000	210.000	140.000	600.000					
		Computer(s) for teaching and learning	100.000	200.000	140.000	440.000					



E.g., an educational institution may have educational programmes which use radio and television and/or computers for pedagogical purposes, or different types of Internet

Concepts and Definitions



COMPUTER LABORATORY

Is a room or space equipped with computers (networked or not) devoted to pedagogical use in an educational institution. A computer laboratory must be safe from any disruptive, non-pedagogical content where pupils and teachers may need authorized access credentials. In this context, Internet booth (or community Internet centres) must be excluded unless there is a decisive policy to use such facilities for pedagogical purposes.

Concepts and Definitions



INTERNET FOR TEACHING AND LEARNING

Refers to the use of the Internet to deliver instructional materials on a computer or through other devices, in accordance with learners' pedagogical needs. This mode of instruction helps to develop autonomy in research activities and information literacy skills.

INTERNET

The Internet is a worldwide interconnected computer network. It provides access to a number of communication services including the World Wide Web and carries e-mail, news, entertainment and data files, irrespective of the device used (i.e. not assumed to be only via a computer) and thus can also be accessed by mobile telephone, tablet, PDA, games machine, digital TV etc.).

Concepts and Definitions

Fixed narrowband Internet includes analogue modem (dial-up via standard phone line), ISDN (Integrated Services Digital Network), DSL (Digital Subscriber Line) at advertised download speeds below 256kbit/s (kilobits per second), and other forms of access with an advertised download speed of less than 256 Kbit/s;

Fixed broadband refers to technologies at advertised download speeds of at least 256 Kbit/s such as DSL, cable modem, high speed leased lines, fibre-to-the-home/ building, powerline and other fixed broadband including terrestrial fixed broadband network such as WiMAX and fixed CDMA, and satellite broadband network (via a satellite connection); and

Mobile broadband includes technologies at least 3G, e.g. UMTS via a handset or via a card (e.g. integrated SIM card in a computer) or USB modem; mobile broadband via privately-owned mobile phone networks is excluded.

Concepts and Definitions



LOCAL AREA NETWORK (LAN) refers to a network connecting computers within a localized area such as a single building, department or site; it may be wireless.

INSTITUTIONAL WEBSITE refers to a collection of interlinked web pages, usually under a single domain name, linking pupils and teachers to pertinent pedagogical information, curriculum, educational content, learning activities, and other pedagogical and/ or administrative resources for teachers and pupils that are officially endorsed and organised by relevant education authorities.

OPEN EDUCATIONAL RESOURCES (OER) refers to electronic resources and tools for learning in open document format and released under an intellectual property licence allowing free use, adaptation and distribution. From a statistical perspective, institutions must have a specific policy to devote resources for the coordination and maintenance of an electronic repository for pedagogical use.

Concepts and Definitions

ICT SUPPORT (TECHNICAL) SERVICES

Refer to a range of services implemented by educational institutions in order to ensure permanence and performance of facilities for operating ICT-assisted instruction without discontinuity. The implementation of such services may imply operational or administrative measures to support the sustainability of ICT-assisted operations by assigning a designated unit or staff member to the task or granting renewable quarterly, bi-quarterly or yearly contract(s) to private service provider(s).

Concepts and Definitions

Key objectives behind the use of **ICT support services** by schools may include:



- ascertaining that pedagogic and administrative units, including special needs and library units, identifies its requirements for ICT provision;
- coordinating the effective use of ICT across the whole curriculum and encouraging aspects of cross-curricular planning;
- helping pedagogic and administrative units to consider how ICT can support the teaching and learning of subjects other than computing and what those subjects can contribute to the teaching and learning of ICT skills;
- monitoring how equipment and software are accommodated, acquired, maintained and replaced, and how they are stored, accessed and used by learners and staff;
- ensuring that sensible, transparent decisions are made where there are competing demands for resources and that the school improvement plan encourages and supports the professional development of all staff in the use of ICT in their subjects, in line with school policy and practices; and
- managing the school's ICT technician and network manager, etc.

Section ICT1: ICT infrastructure in schools

Schools		Primary (ISCED 1)	Lower secondary (ISCED 2)	Upper secondary (ISCED 3)	Total primary and secondary schools		
All schools	Total number of schools						
	With:	Electricity					
		Telephone communication facility					
		Internet					
		Of which:	Fixed narrowband Internet				
			Fixed broadband Internet				
			Mobile broadband Internet				
		Radio(s) for teaching and learning					
		Television(s) for teaching and learning					
		Computer(s) for teaching and learning					
		Located in:	Computer laboratories				
			Classrooms				
			Libraries				
		Local Area Network (LAN)					
		Internet for teaching and learning					
Open Educational Resources (OER)							
Institutional website							
ICT support services							
Public schools only	Total number of schools						
	With:	Electricity					
		Telephone communication facility					
		Internet					
		Of which:	Fixed narrowband Internet				
			Fixed broadband Internet				
			Mobile broadband Internet				
		Radio(s) for teaching and learning					
		Television(s) for teaching and learning					
		Computer(s) for teaching and learning					
		Located in:	Computer laboratories				
			Classrooms				
			Libraries				
		Local Area Network (LAN)					
		Internet for teaching and learning					
Open Educational Resources (OER)							
Institutional website							
ICT support services							



Number of schools (Total and public) with electricity, Internet and computers for pedagogical purposes will be incorporated into the Questionnaire of formal education (Questionnaire A)

What is measured ?

Indicator prioritization



Conceptual domains	Indicator label	Indicators
Infrastructure	EDR1*	Proportion of schools with electricity (for ISCED levels 1-3)
	ED1	Proportion of schools with access to a radio used for pedagogical purposes (for ISCED levels 1-3)
	ED2	Proportion of schools with access to a television used for pedagogical purposes (for ISCED levels 1-3)
	ED3	Proportion of schools with a telephone communication facility (for ISCED levels 1-3)
	ED5**	Proportion of schools with Internet access by type <ul style="list-style-type: none"> • Fixed narrowband Internet access (using modem dial-up, ISDN) • Fixed broadband Internet access (DSL, cable, other fixed broadband) • Mobile broadband Internet access
	ED22**	Proportion of schools with access to computers for pedagogical purposes (for ISCED levels 1-3)
	ED23**	Proportion of schools with access to the Internet for pedagogical purposes (for ISCED levels 1-3)

■ Core Indicator

■ Core Indicator + WSIS target and + Education 2030**

What is measured ?

Indicator prioritization

Proportion of schools with access to computers used for pedagogical purposes (or computer-assisted instruction, CAI)

ED22 Proportion of schools with computer-assisted instruction (for ISCED levels 1-3)

Definition:

Number of schools offering computer-assisted instruction expressed as a percentage of the total number of schools in the country for ISCED levels 1-3.

Purpose:

To measure the overall presence and availability of computer-assisted instruction in primary and secondary schools.

Data requirement:

(EICI) Number of educational institutions (public and private) with computer-assisted instruction for ISCED levels 1-3.

(refer to questionnaire item C.1.5)

(EI) Number of educational institutions (public and private) for ISCED levels 1-3.

(refer to questionnaire item C.1)

Method of collection:

Administrative data collection through annual school census (or extract data from school records).

Data source(s):

Statistical unit of the Ministry of Education or, alternatively, the national statistical office.

What is measured ?

Indicator prioritization

Proportion of schools with access to computers used for pedagogical purposes (or computer-assisted instruction, CAI)

Formula:

$$\frac{\sum_{h=1}^3 EICI_h^t}{\sum_{h=1}^3 EI_h^t} * 100$$

Where:

$EICI_h^t$ = Number of educational institutions with computer-assisted instruction at level of education h in school-year t

EI_h^t = Number of educational institutions at level of education h in school-year t

What is measured ?

Indicator prioritization

Proportion of schools with access to computers used for pedagogical purposes (or computer-assisted instruction, CAI)

Analysis and interpretation:

A high percentage or value for this indicator demonstrates that computer-assisted instruction is widely used in schools in a given country, and vice versa.

Besides its use for international comparison, this indicator can be calculated and analyzed by ISCED levels, geographical regions, urban/rural areas, and by public/private schools in order to identify digital gaps and priorities.

Methodological and definition issues or operational limitations:

See Appendix II for a more detailed definition of computer-assisted instruction.

This indicator only reflects the presence and accessibility of computer-assisted instruction in schools, but not the actual intensity of use.

Comments

For more information on UIS statistics of ICT in education, please visit the UIS website:

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