

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

## Building capacity to establish an international statistical framework

Moscow, Russian Federation, 25-27 November 2015

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INSTITUTE *for* STATISTICS

COMMUNICATION *and* INFORMATION  
STATISTICS

# OUTLINE - III

- ❖ Why measure - ICT in education statistics
- ❖ Regional questionnaire on ICT in education
  - ❖ Policy and Curriculum
    - Indicator prioritization
  - ❖ **ICT infrastructure**
    - Indicator prioritization
  - ❖ Enrolment
    - Indicator prioritization
  - ❖ Computers
    - ❖ Indicator prioritization
  - ❖ Teachers
    - Indicator prioritization
- ❖ Sources of Information
- ❖ Data collection and Dissemination

# THE QUESTIONNAIRE - Data sources

## ICT Infrastructure

Section  
E1

Gen. information

Section  
E2

Policy

Curriculum

Section  
E3

ICT Infrastructure

Section  
E4

Enrolment

Section  
E5

Computers

Section  
E6

Teachers

	Primary	Secondary		Total organisational units
	(ISCED 1)	Lower secondary (ISCED 2)	Upper secondary (ISCED 3)	Combined primary and secondary (ISCED 1, 2 and 3)
<b>Total number of educational institutions</b>				
<i>Of which with:</i>				
<b>Electricity</b>				
<b>Telephone communication facility</b>				
<b>Internet (general)</b>				
<i>Of which:</i>				
Narrowband Internet				
Fixed broadband Internet				
Mobile broadband Internet				
<b>ICT/ technical support</b>				
<i>Of which with for teaching and learning:</i>				
<b>Radio(s)</b>				
<b>Television(s)</b>				
<b>Computer(s)</b>				
<i>Located in:</i>				
Computer laborator(ies)				
Classrooms				
Libraries				
<b>Interactive whiteboard(s)</b>				
<b>Local Area Network (LAN)</b>				
<b>Internet</b>				
<b>Website</b>				
<b>Open educational resources (OER)</b>				

# THE QUESTIONNAIRE - Coverage

## ❖ Includes the following:

- ❖ Primary programmes (ISCED 1)
- ❖ Secondary programmes (ISCED 2 and 3)
  - ❖ **General and technical/ vocational education and training (TVET)**
  - ❖ **Public & private (Total)**

## ❖ Excludes the following:

- ❖ Adult education programmes

# RECORDING INFORMATION- STANDARD CODES

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

❖ **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.

# RECORDING INFORMATION- STANDARD 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**

# SECTION E3: EDUCATIONAL INSTITUTIONS AND ICT FACILITIES

## 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 E3: EDUCATIONAL INSTITUTIONS AND ICT FACILITIES

## Double counting

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

*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 E3: EDUCATIONAL INSTITUTIONS AND ICT FACILITIES

**Double counted**

**Not double counted**

	Primary	Secondary		Total organisational units
	(ISCED 1)	Lower secondary (ISCED 2)	Upper secondary (ISCED 3)	Combined primary and secondary (ISCED 1, 2 and 3)
<b>Total number of instructional educational institutions</b>	100	75	50	178
<i>Of which with:</i>				
<b>Electricity</b>	50	60	50	80
<b>Telephone communication facility</b>	35	50	40	55
<b>Internet</b>	30	42	38	75
<i>Of which:</i>				
Narrowband Internet	5	15	10	12
Fixed broadband Internet	25	55	30	60
Mobile broadband Internet	0	20	20	25
<b>ICT/ technical support</b>	10	30	25	32

# SECTION E3: EDUCATIONAL INSTITUTIONS AND ICT FACILITIES



**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.

# SECTION E3: EDUCATIONAL INSTITUTIONS AND ICT FACILITIES



**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.

# SECTION E3: EDUCATIONAL INSTITUTIONS AND ICT FACILITIES



**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.

# SECTION E3: EDUCATIONAL INSTITUTIONS AND ICT FACILITIES



## 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.

# SECTION E3: EDUCATIONAL INSTITUTIONS AND ICT FACILITIES



**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.

# SECTION E3: EDUCATIONAL INSTITUTIONS AND ICT FACILITIES



**ICT/ 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). 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 E3: EDUCATIONAL INSTITUTIONS AND ICT FACILITIES



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

	Primary	Secondary		Total organisational units
	(ISCED 1)	Lower secondary (ISCED 2)	Upper secondary (ISCED 3)	Combined primary and secondary (ISCED 1, 2 and 3)
<b>Total number of instructional educational institutions</b>	100	50	50	150
<i>Of which with:</i>				
<b>Electricity</b>	50	50	50	100
<b>Telephone communication facility</b>	35	40	40	75
<b>Internet</b>	30	38	38	68
<i>Of which:</i>				
Narrowband Internet	5	10	10	15
Fixed broadband Internet	25	30	30	55
Mobile broadband Internet	0	20	20	20
<b>ICT/ technical support</b>	10	25	25	25



***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.***

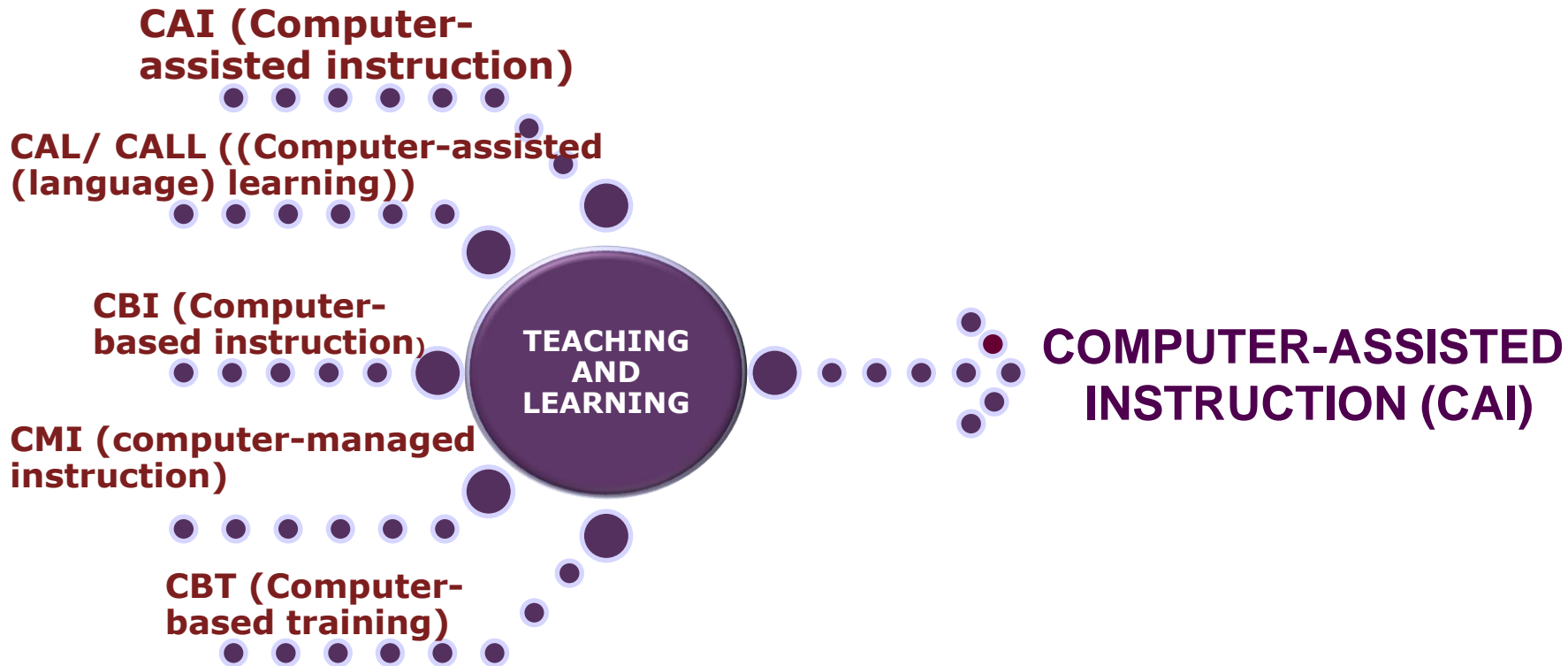


# WHAT IS ICT-ASSISTED INSTRUCTION?

**ICT-ASSISTED INSTRUCTION** refers to teaching and learning methods or models of instruction delivery that employ ICT in supporting, enhancing and enabling content delivery. It includes any, all or combinations of the following: radio-, television-, computer- and Internet-assisted instruction (i.e., online learning). **ICT is however evolving!**



# Complexity of defining computer-assisted instruction (CAI)



# SECTION D: 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

# SECTION E3: EDUCATIONAL INSTITUTIONS AND ICT FACILITIES



**RADIO-ASSISTED INSTRUCTION (RAI)** 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.

# SECTION E3: EDUCATIONAL INSTITUTIONS AND ICT FACILITIES



## 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.

# SECTION E3: EDUCATIONAL INSTITUTIONS AND ICT FACILITIES



**TELEVISION-ASSISTED INSTRUCTION (TAI)** 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.

# SECTION E3: EDUCATIONAL INSTITUTIONS AND ICT FACILITIES



**COMPUTER-ASSISTED INSTRUCTION (CAI)** is an interactive learning method in which a computer is used by teachers and/or pupils to present instructional material, to perform tasks for learning and to help in selecting and accessing additional pedagogical material.

**COMPUTER:** 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. Computers include desktops, laptops (portable) computers, and tablets (or similar handheld computers). Dumb terminals connected to mainframes or mobile labs should also be included.

# SECTION E3: EDUCATIONAL INSTITUTIONS AND ICT FACILITIES



**INTERNET-ASSISTED INSTRUCTION (IAI)** refers to an interactive learning method using 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. From a statistical perspective, an educational institution that has an Internet laboratory devoted to pedagogical use is counted as having Internet-assisted instruction.

## 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.).



# SECTION E3: EDUCATIONAL INSTITUTIONS AND ICT FACILITIES



**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.

## **INTERACTIVE WHITEBOARD**

An instructional tool that allows computer images to be displayed onto a board using a digital projector whereby the instructor and learners can manipulate the content and various screen functions by using their finger directly on the screen (i.e. touch) as a mouse. Interactive whiteboards can add interactivity and collaboration, allowing the integration of media content into the lecture and supporting collaborative learning. Used innovatively they are believed to create a wide range of learning opportunities. Content items can be dragged, clicked or copied; the teacher can also handwrite notes, which can be transformed into text and saved.

# SECTION E3: EDUCATIONAL INSTITUTIONS AND ICT FACILITIES



A **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.

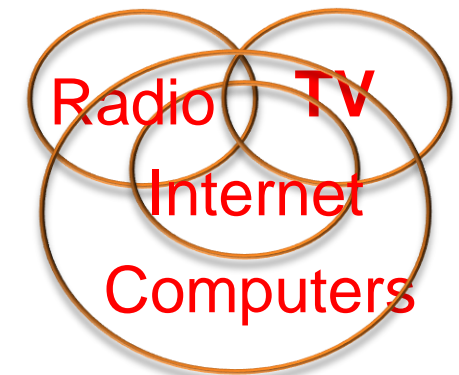
## **INSTITUTIONAL WEBSITE**

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.

# SECTION E3: CONCEPTS AND DEFINITIONS

Completing the questionnaire:  
Categories are **NOT** mutually exclusive



<b>Total number of educational institutions</b>	100	120	88	
<i>Of which with:</i>				
<b>Electricity</b>	75	120	88	
<b>Telephone communication facility</b>	55	120	88	
<b>Internet</b>	40	100	80	
<i>Of which:</i>				
Narrowband Internet	15	50	45	35
Fixed broadband Internet	25	50	30	33
Mobile broadband Internet	5	10	0	7
<b>ICT/ technical support</b>	75	80	50	70
<i>Of which with for teaching and learning:</i>				
<b>Radio(s)</b>	90	88	65	100
<b>Television(s)</b>	52	100	80	75
<b>Computer(s)</b>	55	115	85	100



*E.g., an educational institution may have educational programmes which offer radio-assisted instruction and television and/or computer-assisted instruction, or different types of Internet*

# SECTION E3: EDUCATIONAL INSTITUTIONS AND ICT FACILITIES

	Primary (ISCED 1)			Secondary			Total organisational units Combined primary and secondary (ISCED 1, 2 and 3)			
				Lower secondary (ISCED 2)			Upper secondary (ISCED 3)			
<b>Total number of educational institutions</b>	200			100			50			250
<i>Of which with:</i>										
<b>Electricity</b>	200			100			50			250
<b>Telephone communication facility</b>	200			100			50			250
<b>Internet</b>	100			75			50			200
<i>Of which:</i>										
Narrowband Internet	10			10			5			15
Fixed broadband Internet	80			50			40			130
Mobile broadband Internet	10			15			5			20
<b>ICT/ technical support</b>	20			10			25			45
<i>Of which with for teaching and learning:</i>										
<b>Radio(s)</b>	20			35			12			47
<b>Television(s)</b>	150			75			45			200
<b>Computer(s)</b>	150			80			50			220

# SECTION E3: EDUCATIONAL INSTITUTIONS AND ICT FACILITIES

	Primary (ISCED 1)			Secondary						Total organisational units		
				Lower secondary (ISCED 2)			Upper secondary (ISCED 3)			Combined primary and secondary (ISCED 1, 2 and 3)		
<b>Total number of educational institutions</b>	200	W	ISC2		x	ISC1	50			250		
<i>Of which with:</i>												
<b>Electricity</b>	200	W	ISC2		x	ISC1	50			250		
<b>Telephone communication facility</b>	200	W	ISC2		x	ISC1	50			250		
<b>Internet</b>	0	W	ISC2		x	ISC1	0			150		
<i>Of which:</i>												
Narrowband Internet	Z						Z			Z		
Fixed broadband Internet	Z						Z			Z		
Mobile broadband Internet	Z						Z			Z		
<b>ICT/ technical support</b>	20	W	ISC2		x	ISC1	25			45		
<i>Of which with for teaching and learning:</i>												
<b>Radio(s)</b>	M						M			M		
<b>Television(s)</b>	150	W	ISC2		x	ISC1	45			195		
<b>Computer(s)</b>	150	W	ISC2		x	ISC1	50			200		
<i>Located in:</i>												
Computer laborator(ies)	100	W	ISC2			ISC1	50			150		
Classrooms	60	W	ISC3			ISC1	50			110		
Libraries	10	W	ISC4			ISC1	25			35		
<b>Interactive whiteboard(s)</b>	0	W	ISC5			ISC1	10			10		
<b>Local Area Network (LAN)</b>	20	W	ISC6			ISC1	50			70		
<b>Internet</b>	Z						Z			Z		
<b>Website</b>	Z						Z			Z		
<b>Open educational resources (OER)</b>	Z						Z			Z		

# WHAT IS MEASURED ?

## ❖ Indicator prioritization :

Conceptual domains	Indicator label	Indicator
Infrastructure	EDR1	Proportion of schools with <b>electricity</b>
	ED1	Proportion of schools with a <b>radio used for educational purposes</b>
	ED2	Proportion of schools with a <b>television used for educational purposes</b>
	ED3	Proportion of schools with a <b>telephone communication facility</b>
	ED5	Proportion of schools with <b>Internet access by type</b> <ul style="list-style-type: none"><li>• Any type of Internet access</li><li>• Fixed narrowband Internet access (using modem dial-up, ISDN)</li><li>• Fixed broadband Internet access (DSL, cable, other fixed broadband)</li></ul>
	ED22	Proportion of schools with <b>computer-assisted instruction</b>
	ED23	Proportion of schools with <b>Internet-assisted instruction</b>

- Core indicator
- WSIS target
- WSIS target and Core Indicator

# WHAT IS MEASURED ?

## ❖ Indicator prioritization :

ED22 Proportion of schools with computer-assisted instruction (for ISCED levels 1-3)	
<b>Definition:</b> 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.	<b>Purpose:</b> To measure the overall presence and availability of computer-assisted instruction in primary and secondary schools.
<b>Data requirement:</b> <i>(EICI)</i> Number of educational institutions (public and private) with computer-assisted instruction for ISCED levels 1-3. <i>(refer to questionnaire item C.1.5)</i> <i>(EI)</i> Number of educational institutions (public and private) for ISCED levels 1-3. <i>(refer to questionnaire item C.1)</i>	<b>Method of collection:</b> Administrative data collection through annual school census (or extract data from school records).  <b>Data source(s):</b> Statistical unit of the Ministry of Education or, alternatively, the national statistical office.

# WHAT IS MEASURED ?

## ❖ Indicator prioritization :

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 :

### **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.

# SUMMARY

## You have learned ...

- Completing the questionnaire**
- ICT infrastructure**
- Concepts & definitions**
- What is measured ?**

# QUESTIONS ?



**Thank you**

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