Updated Quick Guide to Low-Cost ICT Devices for Educational Systems in the Developing World

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Across the world, low-cost ICT devices are being used to extend educational opportunities to students. Devices range from pilot programs tailored to specific contexts to more general use products being brought into the classroom.

In 2008, *info*Dev at the World Bank compiled a *Quick Guide to low-cost computing devices and initiatives for the developing world* [1] to try and record the most prominent or promising of these devices.

In the fast-moving world of technology, the two years that have passed since *info*Dev's initial inventory of educational ICT devices have led to considerable change. With this new list, a more accurate and up-to-date stock is presented as of July 2010.

In this new Quick Guide, *info*Dev presents a compilation of these devices arranged by levels of commercialization and intended focus. This is intended to aid policymakers, educators and NGOs who aim to use ICT devices in their educational efforts.

Disclaimer

Please note that this list is for informational purposes only; inclusion here does not suggest any endorsement by *info*Dev of the value or viability of any project, program or organization.

The list is meant to be representational, and is by no means comprehensive. In many instances, specific countries of deployment are linked to specific initiatives; this information comes from published press reports and has not been independently verified by infoDev.

In some instances, products listed here are currently only available in developed country markets; the inclusion of such products here is meant to draw attention to various types of low-cost devices that might be relevant to or available in developing country markets in the future.

[1] *Quick Guide to low-cost computing devices and initiatives for the developing world* http://www.infodev.org/en/Publication.107.html

Commercial low-cost ICT devices that target the Education Market

Name	**Digital Textbook**
URL	http://en.wikipedia.org/wiki/Digital_Textbook
Stage	Commercial
Country	South Korea (currently pilot, plans for national roll-out by 2011)
Description	The Korean Ministry of Education and Human Resources Development has announced that all Korean students will use a 'digital textbook' from Fujitsu (Stylistic ST5030) utilizing the Windows XP Tablet PC. The estimated cost is approximately US$100.

Name	**E-DUC Projeto Caderno Digital ("digital notebook")**
URL	http://www.e-duc.com/
Stage	Commercial
Country	Brazil
Description	Linux-based, low-cost PC project for the education sector in the Brazilian state of Paraná.

Name	**Gecko Edubook**
URL	http://www.norhtec.com/products/gecko/index.html
Stage	Commercial
Country	USA
Description	An upgradeable, low power, portable and cost effective laptop based on the Xcore86, which only uses 1.2 watts of power.

Name	**InkMedia Olea**
URL	http://ink-media.com/Ink-Computer.html

Stage	Commercial
Country	International
Description	A ROM-based laptop computer utilizing open source software.

Name	**Ink Media iLex**
URL	http://www.ink-media.com/
Stage	Commercial
Country	International
Description	Low cost laptop with no moving parts meant to sell for under $300.

Name	**Intel Classmate (sold by several OEM)**
URL	http://www.classmatepc.com/
Stage	Commercial
Country	International
Description	Intel's low-cost laptop designs for the education market - two versions (clamshell & covertable) both run Microsoft Windows XP.

Name	**ITP-C**
URL	http://www.itp-c.info/
Stage	Commercial
Country	Spanish/Portuguese language education markets
Description	Portable 'everything in one' (todo en uno) touchscreen PC device running Windows.

Name	**Leapfrog Clickstart**
URL	http://shop.leapfrog.com/leapfrog/jump/ClickStart%22-My-First-Computer/productDetail/ClickStart-Systems/lfprod22325/cat120006?selectedColor=&selectedSize=&navAction=jump&navCount=0&categoryNav=false

Stage	Commercial
Country	North America
Description	Labelled by many an 'educational toy', the 'ClickStart My First Computer' was designed especially for learners between ages 3-6. Connected to a TV, it is meant to introduce computer and preschool skills.

Name	**One Laptop Per Child XO-1, XO-1.5**
URL	http://laptop.org
Stage	Commercial with Limited Release (minimum order quantities)
Country	International
Description	The most famous of the initiatives seeking to provide low cost computing devices for the developing world, a Linux-based, low-power laptop meant to connect wirelessly to broadband using mesh networks and featuring an innovative display mechanism.

Name	**Teachermate**
URL	http://innovationsforlearning.org/Products.html
Stage	Commercial
Country	USA: Chicago schools
Description	A handheld computer designed for pupils in the first years of primary school.

Commercial ICT devices that can be used for education but are not primarily marketed as such

Name	**Apple iPad**
URL	http://www.apple.com/ipad/
Stage	Commercial
Country	International
Description	Tablet or slate computer with touchscreen interface

Name	**Aleutia E1**
URL	http://www.aleutia.com/products/
Stage	Commercial
Country	UK/Africa
Description	Low-power, ruggedized desktops running Linux, meant to be designed/optimized for use in rural Africa.

Name	**DMP eBox**
URL	http://www.compactpc.com.tw/
Stage	Commercial
Country	International
Description	Series of fanless, very low-power PCs from Taiwan's DMP Electronics.

Name	**Asus Eee PC**
URL	http://eeepc.asus.com/
Stage	Commercial
Country	International

Description	Low-priced, low-power netbooks from Asus

Name	**Elonex ONE**
URL	http://www.elonexone.co.uk/
Stage	Commercial
Country	UK
Description	A sub-£100, Linux-based laptop out of the UK aimed at the education sector.

Name	**Fulong Mini-PC (also known as "Longmeng", "Lemote Box", "Loongson Box")**
URL	http://www.lemote.com/
Stage	Commercial
Country	China
Description	An inexpensive, light-weight, Linux-based laptop utilizing a Godson-2 (Loongson) processor developed at an institute of the Chinese Academy of Sciences (CAS), designed for use in remote areas of China. A joint venture between Jiangsu Menglan Group Corporation and the Institute of Computing Technology at CAS.

Name	**Inveneo Computing Station**
URL	http://www.inveneo.org/
Stage	Commerical
Country	International (mainly Africa)
Description	The Inveneo Computing System is meant to provide computing, Internet Access and telephony for places with little or no access to electricity or affordable communications. The Inveneo System, which utilizes open source software and solar power, is specifically designed to meet the needs of Non-Government Organizations (NGOs), local governments, private entities and the communities they serve.

Name	**iT ATM1088(L)**
URL	http://asiatotal.net/

Stage	Commercial
Country	Brazil
Description	Compact portable device from Aisatotal.net running Windows CE meant to be distributed free of charge to end users, through the support of sponsors (who 'own' various hotkeys on the device that directly connect users to specific web sites).

Name	**Amazon Kindle**
URL	http://www.amazon.com/dp/B000FI73MA/
Stage	Commercial
Country	USA
Description	The Amazon Kindle (from Amazon.com) is a wireless e-book reader currently only available in the UNited States, where it retails for $399.

Name	**Norhtec MicroClient JrMX**
URL	http://www.norhtec.com/
Stage	Commercial
Country	International
Description	Norhtec's small, low-power, low-noise MicroClient JrMX uses flash memory and features a low-end AMD processor. The MicroClient JrMX is the first small form factor client to use the Xcore86 "Device on Chip".

Name	**Nokia N770 Internet Tablet**
URL	http://europe.nokia.com/770
Stage	Commercial
Country	International
Description	A small palmtop wireless Internet appliance operated with a stylus running Linux for wireless Internet browsing and e-mail with 64MB of RAM and 128MB of Flash.

Name	**Ncomputing**

URL	http://www.ncomputing.com
Stage	Commercial
Country	International
Description	Low-cost thin client solution

Name	**Simputer**
URL	http://www.simputer.org/
Stage	Commercial
Country	India
Description	The first high profile initiative to provide low cost computing devices for the developing world, the Simputer is a small handheld computer utilizing the Linux operating system. 'Simputer' stands for 'Simple, Inexpensive and Multilingual People's compUTER'

Name	**FiveRivers Tech Sirius**
URL	http://www.fiveriverstech.com/sirius.htm
Stage	Commercial
Country	Pakistan
Description	A low-cost handheld computer between the size of a PDA and a sub-notebook, the battery-powered Sirius uses the AlephOS and features zero moving parts, a full QWERTY keyboard and can interface with other peripherals including mobile phones and PCs).

Name	**OpenMoko WikiReader**
URL	http://thewikireader.com/
Stage	Commerical
Country	International
Description	The Wikipedia on a single use device - handheld, battery powered eReader

Name	**Apple Ipod Touch**

URL	http://www.apple.com/ipodtouch/
Stage	Commercial
Country	International
Description	A low -cost handheld device with touchscreen interface, wifi connectivity and 'apps' available online from free.

Pilot or Concept ICT devices that target the Education Market

Name	**EELS (EduVision E-Learning System)**
URL	http://www.archimuse.com/publishing/ichim05/herren_paper.pdf
Stage	Pilot
Country	Kenya
Description	EELS is an end-to-end content management system utilizing open source software to distribute digital educational content to an 'eSlate', tablet device into which data is input via a stylus or buttons. The eSlate is connected wirelessly to a base station which receives content via satellite radio.

Name	**Qualcomm Kayak**
URL	http://www.slashgear.com/qualcomm-kayak-3g-connected-low-cost-pc-reference-design-1222445/
Stage	Reference Design
Country	SE Asia
Description	PC alternative to make high-speed wireless Internet access more widely available and affordable in emerging markets by leveraging the widespread availability of 3G wireless broadband

Name	**Literacy Bridge Talking Book**
URL	http://www.literacybridge.org/
Stage	Pilot
Country	Ghana
Description	Literacy Bridge's Talking Book is a low-cost audio computer designed to improve literacy skills and facilitate access to information for rural people.

Name	**Ndiyo!**
URL	http://www.ndiyo.org/
Stage	Pilot
Country	South Africa
Description	An ultra-thin-client computing solution utilizing open source software developed in Cambridge (UK).

Name	**Solo**
URL	http://www.explan.co.uk/solo/index.shtml
Stage	Prototype
Country	UK
Description	The Solo is meant to be an ultra-low power, transportable computer designed to operate from a number of different power sources, including solar panels and lead-acid vehicle batteries.

Name	**MILLEE**
URL	http://www.millee.org
Stage	Pilot
Country	India
Description	Educational, interactive games on low-cost mobile phones

Discontinued ICT devices that targeted the Education Market

Name	**Geekcorps Desert PC**
URL	http://web.archive.org/web/20080429192114/http://www.geekcorps.org/2006/09/geekcorps-malis-innovative-suc/
Stage	Pilot
Country	Mali
Description	From GeekCorps Mali, a computer built using using locally-available, off-shelf hardware components and free, open source software able to operate in high heat, high dust environments with low electricity and provide affordable Internet access, based on VIA's Mini-ITX.

Name	**Jhai PC**
URL	http://www.jhai.org/jhai_remoteIT.htm
Stage	Pilot
Country	Laos, Navajo Nation (USA)
Description	A low-power, ruggedized PC utilizing localized open source software applications, designed for use in remote villages and other challenging environments.

Name	**AMD Personal Internet Communicator**
URL	http://50x15.amd.com/en-us/
Stage	Discontinued
Country	Mexico, other countries
Description	The first product to emerge out of AMD's "50x15" initiative, the PIC was meant to provide managed Internet access, running a version of Microsoft Windows.

Name	**Chang Feng**

URL	http://www.intel.com/business/casestudies/beijingruralpc.pdf
Stage	Discontinued
Country	China
Description	A ruggedized 'rural PC' from Beijing Science and Technology Commission utilizing Red Flag Linux that links farmers to agricultural information networks; it also ships with educational, health and karaoke software. (Chang Feng means 'Strong Wind').

Name	**Computador Popular (Popular PC)**
URL	
Stage	Discontinued
Country	Brazil
Description	Computador Popular was an Internet appliance without a floppy, hard disk or CD-ROM drive primarily meant for Internet access in Brazil. Also known as the Popular PC (PPC) and the 'Volkscomputer', it was supported by the government's Fund for the Universalization of Communication.

Name	**Cowboy**
URL	http://www.ltia.fc.unesp.br/cowboy/
Stage	Discontinued
Country	Brazil
Description	Code name for an "ultra-portable" computing device (between a PC and a PDA) running a modified version of Windows CE being developed by Brazil's Unesp (State University of São Paulo "Julio de Mesquita Filho") with a price-point of US$250.

Name	**decTOP**
URL	http://www.dataevolution.com/
Stage	Discontinued
Country	North America
Description	Successor to AMD's PIC, Data Evolution's decTOP is a rugged, low-cost computing device runing Linux or Windows CE.

Name	**gPC**
URL	http://www.everex.com/products/gpc/gpc.htm
Stage	Discontinued
Country	USA
Description	Low-cost, low-power PC from Everex sold through Walmart (sometimes incorrectly, and misleadingly, referred to as the 'Google PC').

Name	**HP 441**
URL	http://www.hp.com/hpinfo/newsroom/press/2004/040624c.html
Stage	Discontinued
Country	South Africa
Description	The Linux-based HP 441 desktop solution allowed for four independent users to simultaneously use a single PC. This product, which has been discontinued, was born from HP experiences in a pilot project in Mogalakwena, South Africa.

Name	**Intel Community PC**
URL	http://www.intel.com/pressroom/archive/releases/20060329corp.htm
Stage	Discontinued
Country	India, China
Description	The umbrella term for products and initiatives related to 'ruggedized' PC from Intel and others designed to operate in remote communities with challenging environmental conditions (weather, unreliable power). Many of these computers are expected to be used in Internet “kiosk” centers in villages in India. Wipro's ''SuperGenius Bharat PC'' is one example. In China, this has a few incarnations, from the ''Happy Family'' PC (JiaJiaLe), produced by Intel and Haier to the Chang Feng (see separate entry above), to the Shandong Rural Worker’s PC, in which Microsoft is also involved.

Name	**IQ PC**
URL	http://arstechnica.com/hardware/news/2007/06/microsoft-testing-pc-sales-in-

	india.ars
Stage	Discontinued
Country	India
Description	Low-cost education PC from Microsoft and AMD for the Indian market, in partnership with Zenith and Wipro.

Name	**Janata PC**
Stage	Discontinued
Country	India
Description	Low-cost computing device from Wipro, HCL and India's Manufacturers Association of Information Technology (MAIT) running Linux.

Name	**Mecer Education PC**
URL	http://www.mecer.co.za/
Stage	Discontinued
Country	South Africa
Description	Low-cost education PC for the South African market running a Via processor.

Name	**Municator**
URL	http://yellowsheepriver.org/products_e.htm
Stage	Discontinued
Country	China
Description	An inexpensive Linux-based computer from YellowSheepRiver China, designed for Chinese markets utilizing the Godson-2 (Loongson) CPU.

Name	**Nova Net PC, Nova Net TV**
URL	http://www.novatium.com/
Stage	Discontinued
Country	India

Description	Novatium produces the Nova Net PC, a low-cost network computer, and the Nova Net TV, a low-cost home entertainment computing device.

Name	**Open Book project**
URL	http://www.obook.info/wiki/
Stage	Hardware project discontinued
Country	International
Description	An initiative to develop an open source hardware and software specification for future products.

Name	**PCtvt**
URL	http://www50.brinkster.com/pctvt/
Stage	Discontinued
Country	India
Description	A low-cost, wirelessly networked personal computer developed at Carnegie Mellon University. PCtvt stands for "PC, TV, Video and Telephone"

Name	**Sinomatic**
URL	http://chinese.engadget.com/2006/10/12/china-sinomanic-notebook-appear/
Stage	Discontinued
Country	China
Description	Based on the Godson-1 (Loongson) processor, this series of low cost laptop is from Sichuan Guoxin Technology. The Tianhua GX-1C and GX-1C sub-notebooks are meant for Chinese schools; the Tian Yan GX-2 will use a Tv for display and is meant for rural farmers.

Name	**SolarLite PC**
URL	https://www.comminit.com/en/node/215404/307
Stage	Discontinued
Country	Canada

Description	Based on Open Hardware concept, SolarLite PC designs are meant to be provided royalty free so that individual countries or large organizations can manufacture low-cost computers for themselves in perpetuity.

Name	**Terra/PHD**
URL	http://www.via.com.tw/en/initiatives/empowered/
Stage	Discontinued
Country	India
Description	The Terra/PHD systems designed by the Taiwanese firm VIA are meant to be low-cost, energy-efficient computing appliances and are part of Via's PC-1 Initiative.

Name	**VillagePDA (link courtesy of the Internet Archive)**
URL	http://web.archive.org/web/20020628092832/http://www.villagepda.com/
Stage	Commercial pilot, discontinued
Country	Kenya, Sri Lanka
Description	The sub-US$25 VillagePDA was meant to offer wireless access to villagers and fisherman in rural Kenya and Sri Lanka.

Name	**Zonbu**
URL	http://www.zonbu.com/home/index.htm#tab1
Stage	Hardware discontinued
Country	International
Description	Low cost, energy efficient laptop from Everex running Linux; initial price is subsidized if user purchases a monthly maintenance subscription plan. (Lower cost desktop version also available