

# School tablets project for developing countries



↑ Source image : A indian tablet at 35 dollars, Thursday 20 october 2011, <http://electrosphere.blogspot.fr/2011/10/une-tablette-tactile-indienne-35.html>

French text translated by Google translator. We apologize for any translation mistakes that may have occurred.

Study author : Benjamin LISAN

Email : [benjamin.lisan@free.fr](mailto:benjamin.lisan@free.fr)

Document creation date : 03/07/2014

Document update date : 04/07/2014. Version V1.0

# School tablets for poor countries

## 0. Summary

2

### 1. Introduction

#### 1a. secondary specifications

#### 2. What is a tablet ?

#### 3. Evaluation of the cost of these tablets.

#### 4. Additional parameters to evaluate.

##### 4.1. Tablet size.

##### 4.1bis. Tablet weight.

##### 4.1ter. Format of the tablet.

##### 4.2. Importance of the existence of a microSD slot.

##### 4.3. Minimum necessary ports or slots.

##### 4.4. What OS? (need for a standard Android updated regularly).

##### 4.5. Presence or absence of an external keyboard?

##### 4.6. The fragility of the tablets => precautions.

##### 4.6bis. The risk of theft/steal

##### 4.6ter. Parental Control

##### 4.7. What software provide?

##### 4.8. Updating software.

##### 4.9. The screen technology.

##### 4.10. The resolution of the screen.

# School tablets for poor countries

## 0. Sommaire

3

4.11. The processor and memory

4.12. The "no name" tablets

4.13. Ecological aspects

4.14. Examples ...

5. Conclusion.

A1. Appendix: Specifications of Aakash tablets.

A2. Appendix: suggestion of free software and applications.

A3. Appendix: update the document database.

A4. Schedule: For more ...

A4. Appendix: Glossary



The example of the low cost Akash Indian tablet (~ 45 US \$).

# School tablets for poor countries

## 1. Introduction

4

- The computer is an amazing tool and means of disseminating knowledge.
- But many children have no access to it, in poor countries.
- For most schools in poor countries do not have computer equipment, can be easily made available to students, so that they allow them access to a wealth of knowledge (via the Internet ...) and learn computer skills, a lack of resources.
- Poor countries (often located in the South), with low computer penetration rate compared to rich countries (often located in the North) will be penalized in their development relative to that of rich countries ["good workers with the right tools" says someone]. This is what is called "[North-South digital divide](#)".
- Eventually, the economic gap, educational continues to increase between rich and poor countries, which are still also called the "developing countries".
- But computer equipment are expensive for schools in poor countries, who would want to be equip with it.

# School tablets for poor countries

5

## 1. Introduction (continuation)

- To reduce the acquisition cost of the equipment for these poor schools, we offer IT solution for these schools, consisting of tablets for school or educational uses and ***if possible at low cost.***
  - In addition, they consume less electricity than a desktop or laptop computer.
- **In the remainder of this paper, we study the feasibility of this solution.**
- **We try to develop the specifications of the ideal solution for developing country school tablet, taking into account the current experiments.**



Tablet with the keyboard cover, displaying a listing on agronomic sheet.  
Tablet belonging to the author of this document and serving as a "demonstrator".

# School tablets for poor countries

## 1bis. Secondary specifications

6

- The goal is that each tablet serve as a small light laptop for each child, students, teachers, professors and even agronomists etc. ..
- Another goal would be, with these tablets, a light and itinerant computer room, easy to carry, for example, by bush taxi [taxibrousse], motorbike ... from one school to the other schools, in the regions without any computer equipment. **Provided [be careful] that these tablets may not break, under conditions of hard transport (as, for ex., bush taxi ...).**
- It can be used to support a document database rather extensive for the sustainable development of developing countries. And therefore it can serve as light " e-book reader" of documents to PDF, Word, Powerpoint, Excel, Images (jpg, gif, png, ...), video (mpeg, avi, flv ...).



← 11 tablets and their accessories and their covers, keyboards, offered by the author, the Beninese Association AJEDD, in Benin. The author has all transported (and bring) in his backpack, on site.

# School tablets for poor countries

## 2. What is a tablet?

7

A **tablet computer**, or simply **tablet**, is a [mobile computer](#) with [display](#), [circuitry](#) and [battery](#) in a single unit. Tablets are equipped with sensors, including [cameras](#), [microphone](#), [accelerometer](#) and [touchscreen](#), with finger or stylus gestures replacing [computer mouse](#) and [keyboard](#). Tablets may include physical buttons, e.g., to control basic features such as speaker volume and power and ports for network communications and to charge the battery. An on-screen, pop-up [virtual keyboard](#) is usually used for typing. Tablets are typically larger than [smart phones](#) or [personal digital assistants](#) at 7 inches (18 cm) or larger, measured diagonally (Source : Tablet computer, [http://en.wikipedia.org/wiki/Tablet\\_computer](http://en.wikipedia.org/wiki/Tablet_computer)).



[Samsung Galaxy Tab 3](#)



[Microsoft Surface 2](#)

# School tablets for poor countries

## 3. Evaluations of the cost of these tablets

8

Indian touchscreen tablet, the Akash or Aakash is the world's cheapest. **It is sold U.S. \$ 45 in India:**

The touch pad, called Aakash, or "sky" in Hindi, was designed by the Canadian Developer [DataWind](#). These tablets are manufactured by the company [Quad electronics](#) (°), based in India, in [Hyderabad](#). Then they are sold to the Indian government for about **\$ 45 each** (with a grant of this government, they are sold at **\$ 35** for students and Indian teachers).



Various views of the Indian low-cost tablet, **Aakash**.

(°) **QUAD Electronic Solutions** Pvt Ltd

Adresse : Medchal, Secunderabad, Telangana 502401, Inde

Téléphone : +91 84 18 308001, Site Internet : <http://www.quadelectronics.com/>

# School tablets for poor countries

## 3. Evaluations of the cost of these tablets (continuation)

9

The **Aakash** tablets are now in different versions.

View the price of these models, in Rupees on the site :

<http://www.akashtablet.com/>

Example :

**Aakash Ubislate 7Ci Model**, 9 inch touch screen =>

4GB flash memory

(WiFi, 3G via dongle)

1 GHz processor

Andriod OS v4.1

=> Rs 4999.00 (Indian rroupies) : **61,34 EUROS** or **83,73 USD**

Source : <http://www.akashtablet.com/product.php?prodid=8>



Various views of the tablet **Aakash**.



9

# School tablets for poor countries

## 3. Evaluations of the cost of these tablets (continuation)

10

### Price of accessories to add more:

1. Cable connector plug male micro-USB <=> USB female (Amazon) taking 5.38 € incl tax
2. USB Multi Memory Reader Micro SD SDHC MMC TF (eBay): 1,69 € incl tax
3. Micro-SD card 32GB or 64GB + Class 10 adapter (Amazon) : **€ 33.88 incl tax**
4. Cover with keypad 10 "Android tablets (Amazon): 16 € incl tax
5. *Or USB + Leather Case / Stylus for Tablet 9 "Black Keyboard (Amazon) : 10,60 € incl tax*
6. DS stylus (Amazon) [It is better stylus fine tip stiff nylon]: 0,74 € incl tax.
7. Neoprene (or silicone gel) 9 inches (Amazon): 9,90 € incl tax.
8. Tight Cover Pouch for Tablet PC, Size: 10 (ChiniStore): € 5.30 incl tax.
9. Earphones, 3.5 mm jack (eBay / acelectronic11): 1 € incl tax.
10. toilet kit / transparent storage for storing the power supply and accessories (Ebay): 1,35 € incl tax.
11. *Cables Micro HDMI connector plug male <=> HDMI female (optional) (Amazon) taken: 3,5 € incl tax*
12. *Transparent cover card holder (hiking) M Queshua 100 to protect the tablet (the cover + keyboard) rain (optional) (Decathlon): 4,5 € incl tax.*

Minimum total for accessories : 59,94 € incl tax

# School tablets for poor countries

## 3. Evaluations of the cost of these tablets (continuation)

11

### Accessory pricing (prices)



Female USB to Micro USB  
Male (5,38 € incl tax, on Amazon).



Valueline cable CABLE-5506-1.5  
HDMI vers Micro HDMI 1,5 m  
(3,5 € incl tax, on Amazon).  
Facultatif.

microSD memory card ↓



↙ Classe 10 adapter

**microSDXC SanDisk Ultra Android 64 Go**  
Memory card + **adaptateur Classe 10**  
UHS-I  
(total : 33,88 € incl tax, on Amazon).

The most expensive item.



LOT OF 10 PENS Ds & DSLite  
(7,46 € incl tax, soit 0,74 € /  
unit, on Amazon).



USB Multi Memory Reader for  
Micro SD MMC SDHC TF (1,69  
€ incl tax, on eBay / FIVE STAR  
STORE CO., LIMITED).



Cover with keypad 10" for Android  
tablets (AZERTY or QUERTY)  
(14,25 € + with Shipping = 16 € incl tax,  
on Amazon).



Leather Case with  
Keyboard and Stylus  
for 7" Tablets  
(EUR 13,38 € incl tax,  
on Amazon).

# School tablets for poor countries

## 3. Evaluations of the cost of these tablets (continuation)

### Accessory pricing (prices)



Neoprene cover, for 8-9 inches Tablet (9,90 € incl tax, onAmazon).



Lot of 2 kits transparent toilet / storage (1,6 (item) + 1,1 (shipping) = 2,7 € incl tax ou 1,35 € / unit, on eBay / diabolines12).



USB **QWERTY** Keyboard + PU Leather Case Cover / Stylus for 9 Inches PC Tablet (10,60 € incl tax, on eBay / Onibuy (Chine)).

Or [Navitech cover with French AZERTY keyboard for Android tablets 10 inches](#), 11,99 (item) + 3,99 (port) = 15,98 €, Amazon / [Navitech FR](#)).



Silicone Protective Back Cover (US \$ 5.31 incl tax, free of shipping, in AliExpress)

<http://fr.aliexpress.com/w/wholesale-silicon-protective-case-tablet-pc.html>



Tight Cover Pouch (velour) for PC Tablet, Size: 10" (2,90 (item) + 2,40 (port) = 5,30 € incl tax, in CHINISTORE).

<http://www.chinistore.com/>

<http://www.chinistore.com/fr/housse-tablette-tactile/236-acheter-housse-pochette-moulante-pour-tablette-tactile-7-8-10-pouces.html>



In-ear headphones, 3.5 mm jack (eBay/ acelectronic11) : 1 €

# School tablets for poor countries

## 3. Evaluations of the cost of these tablets (continuation)

13

### Total accessory & tablets pricing (prices)

Price with **Ubislate 7Ci, 9', 4 Go, Android 4.1 Tablet** :  
(Android\_Ice Cream Sandwich).

- 1) **Ubislate 7Ci, 9', flash memory 4 Go, Tablet: 61,34 €**
- 2) Accessories: 59,94 €

**TOTAL : 121,28 € (minimum).**



Polaroid Diamond 9' tablet

Prix avec la tablette Polaroid Diamond 9", 8 Go, Android 4,2 Jelly Bean :

- 1) Polaroid Diamond 9' Tablet: 76,83 (item) (°) + shipping (10) : **86,83 € incl tax (Cdiscount).**
- 2) Accessories: 59,94 €

**TOTAL : 146,77 € (au minimum).** (°) On CDISCOUNT, on the date of 07/03/2014 (may vary).

**=> It should also provide shipping cost of the tablet from India => to the destination country.**

**=> We need to ensure that the installed software are free (open source-type).**

# School tablets for poor countries

## 3. Evaluations of the cost of these tablets (continuation & end)

14

### Other consideration:

You should also know that a tablet will be more inexpensive, **the less it will be fast and it will be with less memory capacity** \_ two parameters may be more acceptable in Africa. It is a choice.



The tortoise and the hare, fable by Jean de la Fontaine

# School tablets for poor countries

## 4. Other parameters to assess/evaluate

15

### 4.1. Tablet size

- More tablet, the more it is pleasant to use. Better to have a 9' or 10'.
- By cons, tablet 10' would be more expensive (or heavier) than a tablet 9'. The difference in price from a few € to twenty €.
- Tablet 10' consumes a little more than a tablet mA 9' (5000 mAh battery for tablet 10' vs 3500 mAh battery for tablet 9').
- It is necessary that the size and shape of the tablet is standard and has a standard thickness, so that it can be inserted in a standard keyboard cover.



ToshibaThrive AT100 tablet (with USB, mini-USB, HDM ports & jack) against the Toshiba Tablet Galaxy Tab 10" much finer (with microSD, micro-USB, micro-HDM ports & jack). Source : <http://www.nextinpact.com/news/65358-toshiba-tablette-tactile-android-fine.htm>

# School tablets for poor countries

## 4. Other parameters to assess/evaluate

16

### 4.1bis. Tablet weight

7-inch tablets are more portable than 10 inches, with a generally very light weight, and are therefore preferred for mobile use only. However, it will be more enjoyable to play videos on a screen 10 inches more comfortable to the eyes.

If you buy your tablet on the internet and not in the store, do not hesitate to check the weight displayed by the device, and even thickness.

All hand grip can play in this type of detail.

**Too thick, it may not be comfortable in your hand.**

**Above 400 to 600 grams, the user will probably never take the tablet in her purse.**



### 4.1ter. Format de la tablette

*Some tablets are 4/3 format (iPad, for example), others 16/10 or 16/9. A video will much better on a 16/9 screen.*

Source : [http://www.frandroid.com/dossiers/156820\\_guide-comment-choisir-votre-tablette-android](http://www.frandroid.com/dossiers/156820_guide-comment-choisir-votre-tablette-android)



# School tablets for poor countries

## 4. Other parameters to assess/evaluate

17

### 4.2. Importance of the existence of a microSD slot

- That port or slot is very important: it allows to expand the memory size of the tablet.
- **A tablet, *without the microSD port*, must be rejected (the case of i-pad tablet ...).**
- Often these ports tablets are specified for microSD cards up to 32GB
- **But in fact, this slot, you can adapt microSD memory card up to 64GB.**



The slot for the micro-SD card.



Micro-SD card is inserted into the micro-SD slot.

# School tablets for poor countries

## 4. Other parameters to assess/evaluate

18

### 4.3. Minimum ports or slots necessary

Must have as minimum standard ports :

- 1) A microSD slot (!)
  - 2) MicroUSB port or USB (if the tablet have both at the same time, it is better) (!).
  - 3) Headphone jack (minijack 3.5 mn) for a pair of earphones or headphones.
- Requires that the tablet is powered by 5 volts via a 2.1mm jack plug or via the micro-USB port. **This last slot (or port) is very important because used to recharge the battery of your device, on most tablets.**



↑ Slots or ports tablet ACER W510 (from left to right: 1) Port MicroSD, 2) micro-USB port, 3) Micro HDMI Port).

# School tablets for poor countries

## 4. Other parameters to assess/evaluate

19

### 4.3. Minimum ports or slots necessary (continuation)

#### Optional:

1) The microHDMI port, not always present, useful for displaying the screen of his tablet on the TV or to a projector with an HDMI input (°).

2) *A slot for SIM 3G + card (?)*.

• On the 9" tablet, there is often a micro-USB socket.

• 10" Tablets often have a micro-USB port & a female USB socket (ie a port about 10" tablets. Having more connectors or ports, it is always better).



(°) Example : ↑ **SONY Projector** - VPL-DX120 - Projector - Tri-LCD - XGA - 2600 Lumens - Carrying case included, equipped with a HDMI input B (weighing 2.5 kg) to 299 € (in CDISCOUNT).

Rear from left to right: video jack, audio jack, VGA and **HDMI**.



Tablet connected to a TV via an  
HDMI ⇔ microHDMI cable →



# School tablets for poor countries

## 4. Other parameters to assess/evaluate

20

### 4.4. What OS to choose ?

As i-pad tablet (Apple) is eliminated because of the absence of a micro-SD and the high cost of these (incompatible for school use in poor countries) slot, it remains competition 3 OS (operating systems): a) Android 4.x and > b) Windows 8 and > (or c) Linux : Ubuntu etc.).

(°) more OS iOS Apple is too closed (too manufacturer).

#### a) Android vs Windows :

- The big advantage of Android is that there is an offer applications and extremely wide free software in the "[Google Store](#)" store, online, in comparison with the "[Windows Store](#)" shop (there are much more paying applications in this last shop).
- The use of Android is a bit more intuitive than Windows 8.
- Maybe this will change in the distant or near future (?).

#### b) Linux (Ubuntu ...) :



It provides important open-source softwares. But Linux applications are less known to the general public (to study).



Logo of ANDROID 4.2. (Jelly bean)



Logo of ANDROID 4.4.3. (KitKat)

# School tablets for poor countries

## 4. Other parameters to assess/evaluate

21

### 4.4. What OS ? (continuation)

b) Avoid non-standard versions of Android:

The correct version(s) of Android

Must start from Android 4.1 Jelly Bean. The most recent version is more sophisticated and will be adapted to touchscreen tablets.

In June 2014, the latest version is Android 4.3 output and Android 5.0 may arrive by October 2014.

Quality appliances are regularly updated, so it can be good to watch that side too.

The manufacturer of your tablet is a good indication if you want to keep your tablet over a few months, make sure the brand you have chosen ensures regular updating of its terminals; primary manufacturers do (Sony, Samsung, Acer, etc..), while the most confidential brands are sometimes less astride updates (Polaroid ...).

But the major manufacturers (Sony, Samsung, Acer, etc..) are also the most expensive.

# School tablets for poor countries

## 4. Other parameters to assess/evaluate

22

### 4.4. What OS ? (continuation)

b) Avoid non-standard versions of Android:

Need for Play Google and Google Apps on tablet

It is important to know whether Google Play and Google Apps on your tablet.

What for? Simply because the presence of these applications allow you (in general) to ensure that your tablet has the essential components.

Google Play gate must be installed automatically on your tablet, then you will avoid problems related to unofficial facilities & applications "unknown sources".



Google or Google Play Store Icon (& application) must be present on your tablet.

# School tablets for poor countries

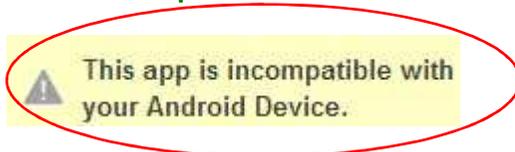
## 4. Other parameters to assess/evaluate

23

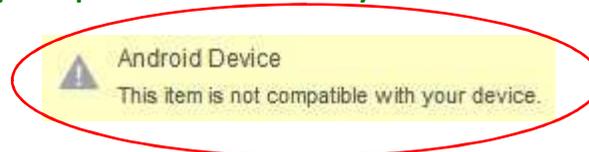
### 4.4. What OS ? (continuation)

#### b) Avoid non-standard versions of Android:

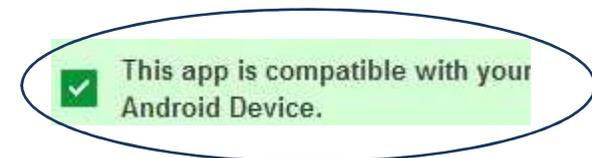
- Avoid "home made" Android (such as Android of Archos and Arnova tablets) that require you to be bound hand and foot with the shop of the manufacturer of the tablet (often not busy. The offer is not very wide). Unless these manufacturers abandoned later, the use of an Android owner.
- With some Android, which are either owners or who can not update some software can not be installed on your tablet \_ Application French Red Cross etc..
- Because of its openness to many tablets and applications, we favor the choice of a Android standard hosting tablets (Google Play on it) and we can update it according to regular updates of Android.
- These parameters are very important => they should be checked.



↑ This app is incompatible with your Android Devices (KO)



↑ This item is not compatible with your device (KO)



↑ This app is compatible with your Android Device (OK).

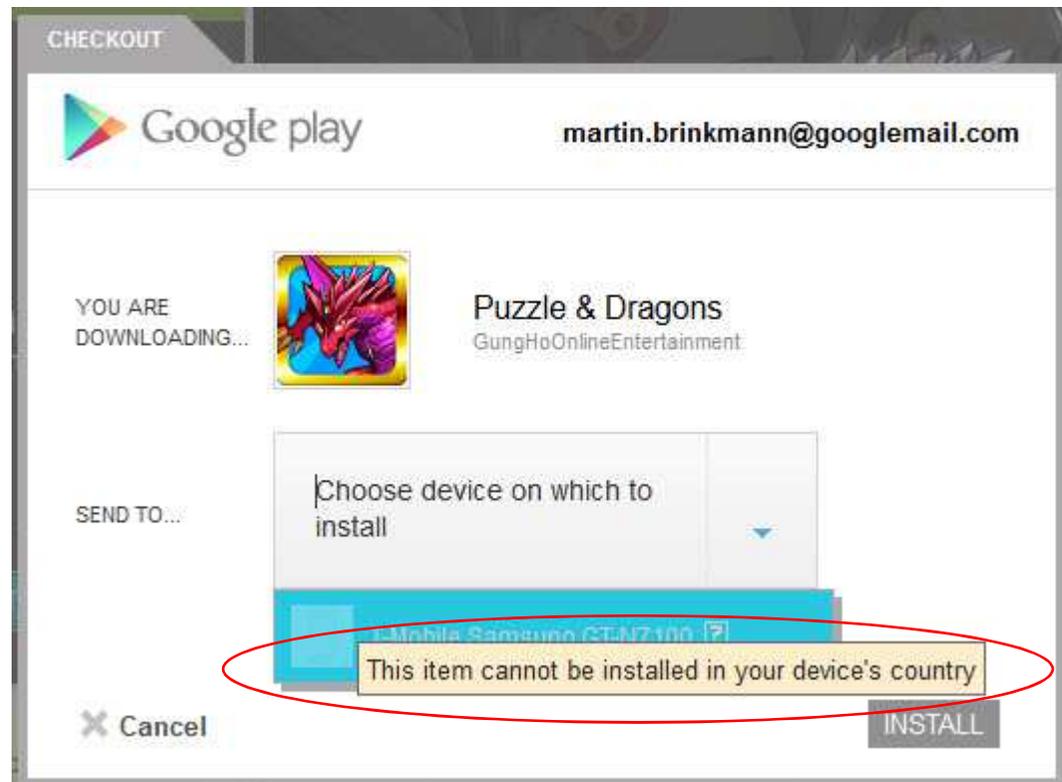
# School tablets for poor countries

## 4. Other parameters to assess/evaluate

24

### 4.4. What OS ? (continuation)

#### b) Avoid non-standard versions of Android:



↑ "This app is incompatible with all of your devices".  
"This item cannot be installed in your devices country"↑

# School tablets for poor countries

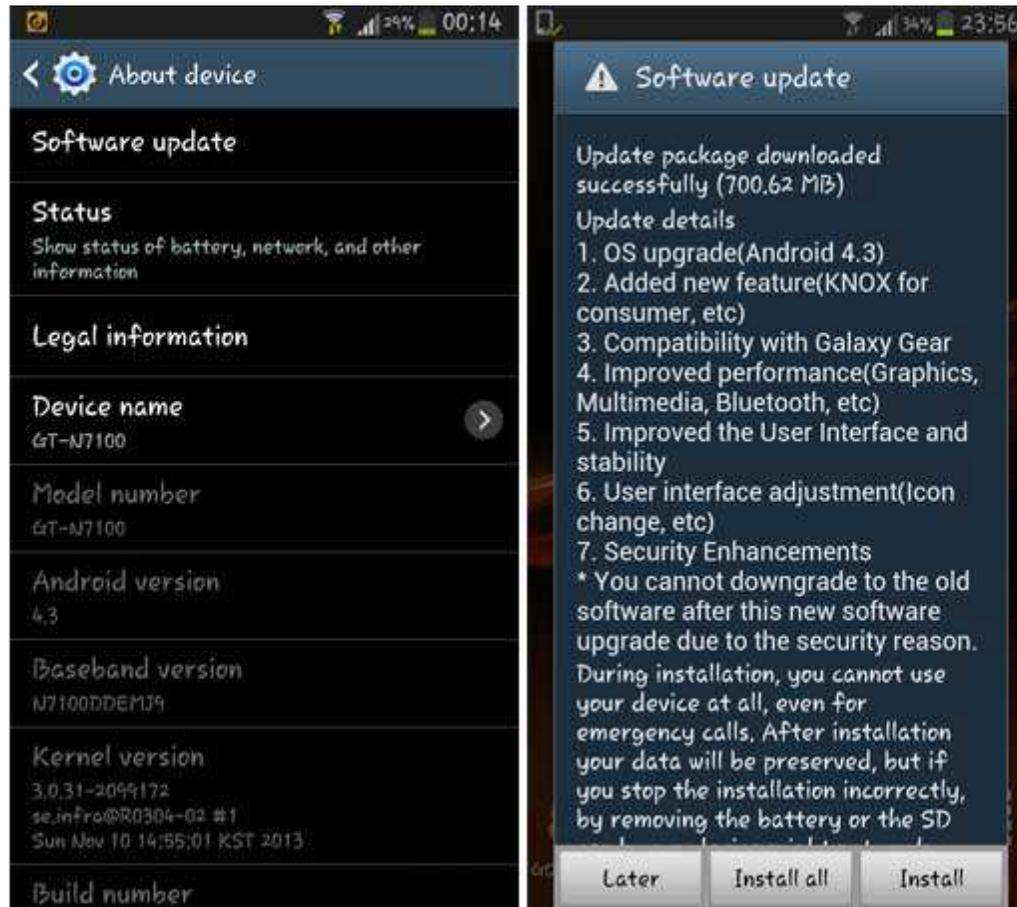
## 4. Other parameters to assess/evaluate

25

### 4.4. What OS ? (continuation)

Software update →

The Polaroid Diamond MIDC ... Android tablets do not have the important option of *Android updating (!)*.



↑ Icon of Android parameters.

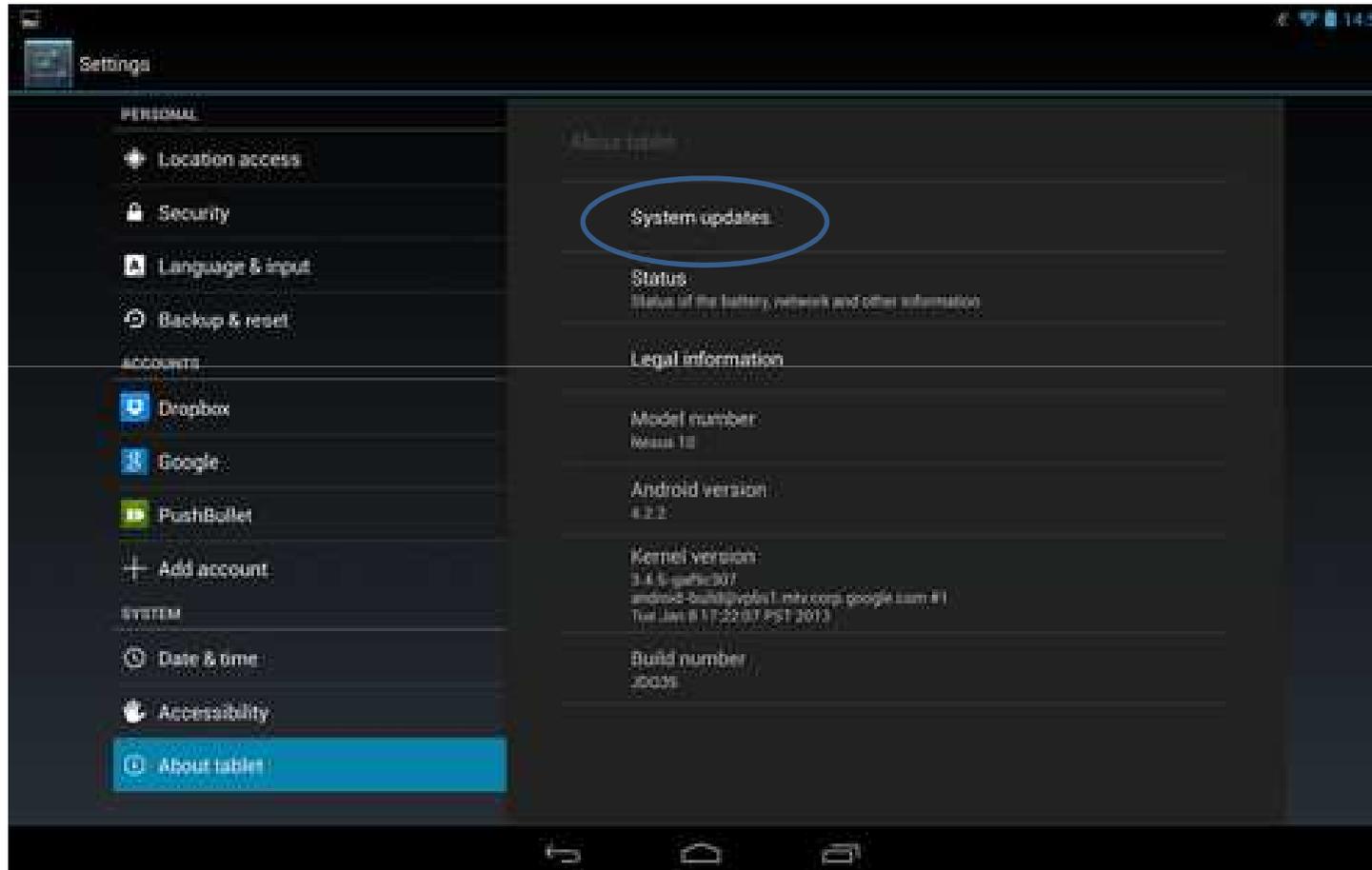
In your settings menu on your Android, you must have a menu item "**Software update**" or "**System Update**".

# School tablets for poor countries

## 4. Other parameters to assess/evaluate

26

### 4.4. What OS ? (continuation)



← System update

In your settings menu on your Android, you must have a menu item "**Software update**" or "**System Update**".

# School tablets for poor countries

## 4. Other parameters to assess/evaluate

27

### 4.5. Presence or absence of an external keyboard?

- It is easier, for any user, typing on an external keyboard, than on the keyboard that appears (or disappears often unintentionally) on touch screen.
- This *keyboard-cover* also serves to protect the tablet against shocks (or falls).
- **Attention !** In francophone countries, order a **AZERTY keyboard** (rarest cover-keyboard models). And English countries, a **QWERTY keyboard** (most common keyboard-cover models).
- If possible, the tablet 9", it is better to order a *keyboard-cover* equipped with a micro-USB.
- Or otherwise, if the *keyboard-cover* has a USB port, ***then you must connect the micro-USB port on the tablet and the USB jack cover the keyboard with a USB Female to Micro USB Male Adapter*** (see picture below).
- If you have a tablet 10", with a USB port, ***better order a keyboard-cover with a USB plug.***



# School tablets for poor countries

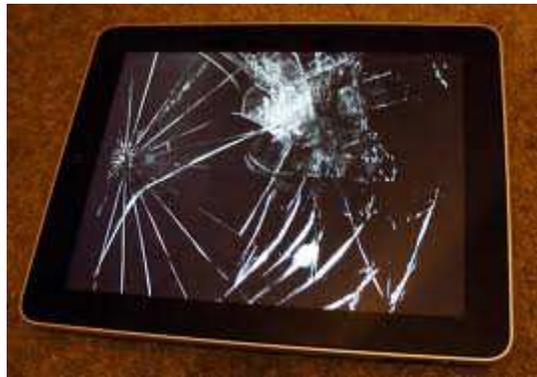
## 4. Other parameters to assess/evaluate

28

### 4.6. The fragility of the tablets => precautions

Tablets \_ especially their touch screen \_ is extremely fragile and break almost always, each fall or when you walk on it (see pictures below).

The neoprene, rubber or silicone gel cover is not enough to protect them from shocks.



www.shutterstock.com · 100974136



# School tablets for poor countries

## 4. Other parameters to assess/evaluate

### 4.6. The fragility of the tablets => precautions

#### How to protect? Safety rules:

1. On the work table or desk of the student or the teacher, the tablet must always be placed in its cover-keyboard in position.
2. During transport, it must a) be first row in her tight cover (in neoprene, rubber, silicone gel), b) then row between the two flaps of the *keyboard-cover*, c) and during prolonged transport, all [each tablet + *keyboard-cover*] must be placed in bubble wrap.
3. We need the bag containing the accessories are completely separate and not joined with touch screen tablet (block power pads should not touch it ...).
4. **We must *at all costs (!)* no protruding element is placed door overhang on the tablet screen. This touch screen must be hyper-protected against shocks.**



bubble wrap

29



# School tablets for poor countries

## 4. Other parameters to assess/evaluate

30

### 4.6. The fragility of the tablets => precautions

#### Future developments expected for tablets:

- Should ask manufacturers of tablets or touch screens (Saint-Gobain? Bayer? ...) that this part is made of heavy laminated glass or thick **polycarbonate** (shielded).
- Should the shell (hull) of tablet made in **aluminum** \_ compartmentalized large cells, honeycomb-type \_ where would be accommodated each electronic component, so that the shell is hard to deform under impact, and is covered with a **anti-shock rubber** (?).
- It would have to fool with a **dust filter** and a **waterproof shell**. And that each port is covered with a **rubberized cover**.



Accessories packed in a transparent plastic cover (and stored separately from the tablet and never pressed against the touch screen it). ↑

# School tablets for poor countries

## 4. Other parameters to assess/evaluate

31

### 4.6bis. The risk of steal/larceny

- They are easy to carry and thus steal.
- They must be stored in the *safe-deposit box* or closed by a *steel reinforced door*, in a closed room and equipped with an *alarm signal* (near the watchman and if possible, a person can monitor it).
- Consider that the tablets could be also attached to the ground, with a lock cable (solution to study).



# School tablets for poor countries

## 4. Other parameters to assess/evaluate

32

### 4.6ter. Parental control (to limit some access)

To prevent students access social networks, online games and other content supposed to be blocked, there are software or applications of "parental control" which can lock access to not recommended applications and contents.

Most of these software, on the tablets, offer the following possibilities:

#### 1) To filter the Internet for safe navigation

Detect and block all inappropriate sites depending on the age of the children.

Customize filtering by prohibiting or authorizing certain sites.

A search engine for secure learning internet safely.

#### 2) To control the time of use of tablets by children



Free

[Kid's Place](#) allows a) to restrict access to applications or functions of the tablet, b) self-restart applications, when left by accident, c) block the home button, d) the creation of several customizable profiles. **Lack a secure internet browsing.**

# School tablets for poor countries

## 4. Other parameters to assess/evaluate

33

### 4.6ter. Parental control (to limit some access) (continuation)



Free or  
Payable

Norton Family : The free version already offers many options: history of pages viewed, time slots use or monitoring social networks. Tablet, smartphone or computer. **Warning**: the browser filter often requires audits of the teacher. It should not hesitate to add itself the sites he wants to ban.



Free

Kid's Shell - sécurité enfants prevents children launch unapproved applications or they buy paid applications.

# School tablets for poor countries

## 4. Other parameters to assess/evaluate

34

### 4.6ter. Parental control (to limit some access) (continuation)

Example of use of « Kids Place - With Child Lock »:

- First, create a PIN code, ie create your password.
- Then, the application offers two actions: a) block the home button (which prevents the release of the application by pressing the Home button)
- or b) select the applications for Kids Place. By clicking on this last action, you will find all the applications on your device, you can simply select the ones you want to see for your child (see next page).
- You can categorize applications: for example, a category "Games", another "Play" or "School". To do this, when selecting applications, simply press and hold an application.
- Kids Place also allows you to create multiple users, each with its own profile.
- The child can not exit Kids Place, access the settings or change user without password.
- You can also set a duration of use, to the nearest minute.
- At the end of the specified time, Kids Place will display a screen asking for your password.

Source : Kids Place : votre enfant peut jouer en toute sécurité, Joséphine Dusol, <http://www.androidpit.fr/test-kids-place>

# School tablets for poor countries

## 4. Other parameters to assess/evaluate

35

### 4.6ter. Parental control (to limit some access) (continuation)

Example of use of « Kids Place - With Child Lock »: (continuation) :



↑ Left: the first screen after set up password.  
Right: personalize [name] your application categories ↑ / © AndroidPIT

Sources : Kids Place  
: votre enfant peut  
jouer en toute  
sécurité, Joséphine  
Dusol,  
<http://www.androidpit.fr/test-kids-place> &  
<https://play.google.com/store/apps/details?id=com.kiddoware.kidsplace&hl=fr>

# School tablets for poor countries

## 4. Other parameters to assess/evaluate

36

### 4.6ter. Parental control (to limit some access) (continuation)

Example of use of « Kids Place - With Child Lock »: (continuation) :



↑ Left: Add a wallpaper.  
Right: Add new users ↑ / © AndroidPIT

Sources : Kids Place : votre enfant peut jouer en toute sécurité, Joséphine Dusol, <http://www.androidpit.fr/test-kids-place> & <https://play.google.com/store/apps/details?id=com.kiddoware.kidsplace&hl=fr>

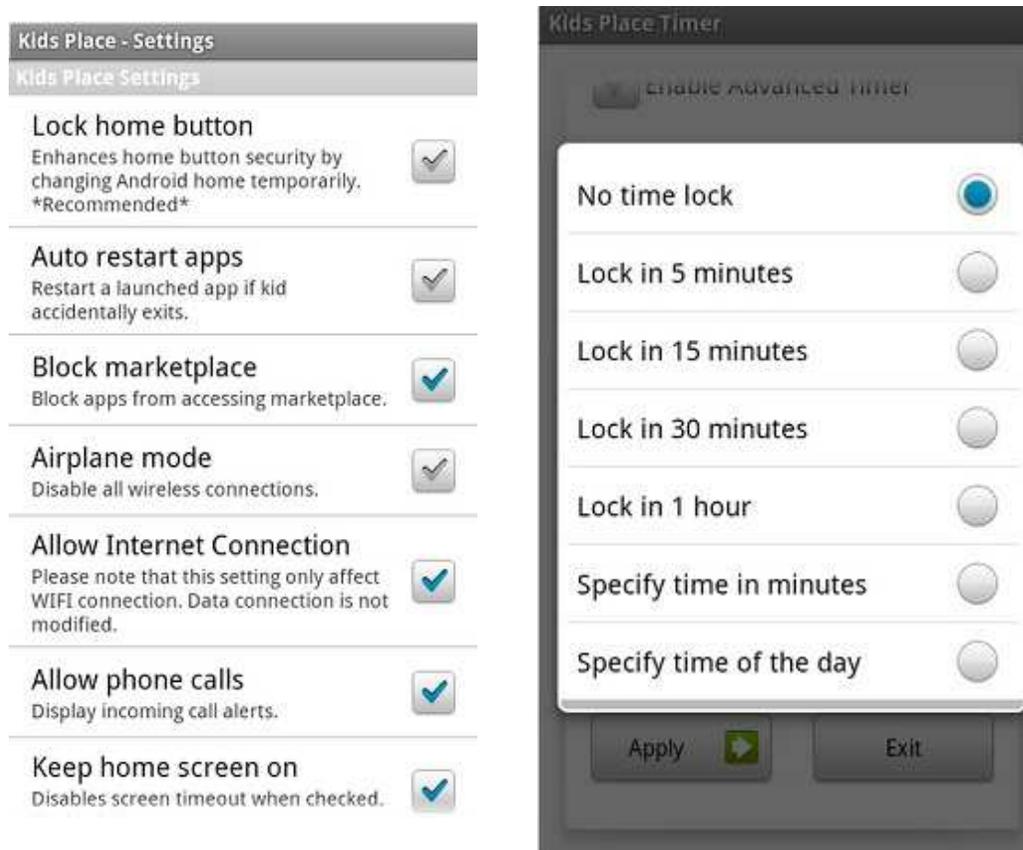
# School tablets for poor countries

## 4. Other parameters to assess/evaluate

37

### 4.6ter. Parental control (to limit some access) (continuation)

Example of use of « Kids Place - With Child Lock »: (continuation) :



Sources : Kids Place : votre enfant peut jouer en toute sécurité, Joséphine Dusol, <http://www.androidpit.fr/test-kids-place> & <https://play.google.com/store/apps/details?id=com.kiddoware.kidsplace&hl=fr>

↑ Options and application settings allow full control of your device.  
You can change the name of the application, or indicate a defined time use ↑ © AndroidPIT

# School tablets for poor countries

## 4. Other parameters to assess/evaluate

38

### 4.6ter. Parental control (to limit some access) (continuation)

Example of use of « Kids Place - With Child Lock »: (continuation) :



Sources : Kids Place : votre enfant peut jouer en toute sécurité, Joséphine Dusol, <http://www.androidpit.fr/test-kids-place> & <https://play.google.com/store/apps/details?id=com.kiddoware.kidsplace&hl=fr>

# School tablets for poor countries

## 4. Other parameters to assess/evaluate

39

### 4.7. What software provide?

The minimum software very useful to foresee:

- The anti-virus **Lookout** (free) \_ an anti-virus is necessary on your tablet \_
- **Acrobat Reader** (free) to read PDF format files (often already installed).
- **OfficeToGo** (to play files in Word, Powerpoint, Excel) (often already installed on the tablet).
- **ES Explorer** (free) (to explore a directory tree on the tablet).
- **Freenotes** (free) (to write quickly (and graphically) notes with the stylus).
- **VLC** (free) (to see all kinds of videos and films, in all kinds of formats).
- *Optionally, "**Clean Master**" or "**Android Assistant**" that can clean up resources (memory, CPU processor) too busy (free applications).*

# School tablets for poor countries

## 4. Other parameters to assess/evaluate

40

### 4.7. What software provide? (continuation)

#### Precautions :

- If possible, software or applications that you add on the tablet should be free.
- Do not provide all the same applications or software, if you have a tablet for Anglophone [English] or Francophone school or users.
- But we must avoid that pollutes you with pop-up advertisements or install, without your knowledge and agreement, other software.
- They must be reliable, they do not block the tablet [the Android] or that require you to reboot the tablet, in order to finish [stop] them.
- Some software may subsequently disappear from "**Google store**" and no longer be maintained (ie, better to choose known and frequently downloaded software).
- If a program takes too much processor time, available free software, such as "**Clean Master**" etc., To show software that consume the most and help you kill (to remove) it/them.

# School tablets for poor countries

## 4. Other parameters to assess/evaluate

41

### 4.7. What software provide? (continuation)

#### Precautions (continuation) :

- Some applications, such as "**DocToGo**" can not be read directly from Word, Powerpoint, Excel, they are stored on the *microSD* memory card. It is then copied by the "**ES explorer**" software on the internal storage of the SD card (and redo the inverse operation, after amendment modifying and saving the file on the internal storage). (at least in its current version).
- You can not have a free user license for antivirus "**Lookout**". Then you must create it before on Internet email address, per student.
- And must then be able to update the software (and **Android**), with WIFI broadband (in Internet café ...), allowing the user to record and validate the free license of some software (such as the license of the "**Lookout**" antivirus ).
- **It is important that all of these programs (the standard ones and those added) are first tested and validated by computer engineer, then by the "end users" (it is already sure that they manage to cope with it, and they understand it and they like it).**
- **Users must be trained to use a tablet and Android, for ½ day to 1 day.**

# School tablets for poor countries

## 4. Other parameters to assess/evaluate

42

### 4.8. Software updates

You can update the software:

- 1) Either a WIFI network accessing the Internet, for example, if an Internet café provides it.
- 2) Or by downloading from the Internet (in a cafe, for example) update software in the form of package (executables as having extension ". **pkg**"), then is deposited on the microSD card.
- 3) Then, replace the microSD card into the slot (location) in the touch pad.
- 4) We search the microSD card, this package with "**ES Explorer**" tool or the "[**Android**] **Manager File**".
- 5) Then this package is executed (by clicking it).

# School tablets for poor countries

## 4. Other parameters to assess/evaluate

43

### 4.9. The screen technology

Each tablet gets a very specific screen technology. IPS generally, it can also be PLS or AMOLED ... No matter the time it is not from TN.

### 4.10. The screen resolution

Today, we will build a minimum on the 1024 x 600 pixels. Know all the same as the latest tablets favor of 1280 x 800 pixels. With these resolutions, more problems icons too pixelated. The content displayed is sharp, clear and with a good level of detail. To summarize, the standard is 1280 x 800 pixels.

However, all applications are not "UltraHD" Ready, you might have some surprises on tablets with higher resolutions. Maious screen resolution greatly affects the autonomy of tablets.

# School tablets for poor countries

## 4. Other parameters to assess/evaluate

44

### 4.11. The processor and memory

Tablets under a Nvidia Tegra 4 processor, Qualcomm Snapdragon 800, 600 or S4 Pro have good performance.

**Prefer recognized processors** (Qualcomm, NVIDIA) or check (at least) if the processor is at least based on an ARM Cortex-A9. This last point is the minimum to ensure proper performance.

RAM is also part of the criteria to look at when talking about the performance of the tablet.

**Note that 1 GB is the norm now in terms of RAM for touch pads.** You can rigor down to 512 MB, if you have a relatively basic use (not to say rustic) of the device; it will be enough just to make the latest version of Android Jelly Bean turn without too much hassle.

**Random access memory (RAM) is not to be confused with the internal storage.** The latter usually amounts to 8, 16 or 32 GB depending on the version. **Prefer at least 8 GB of internal memory, this is the minimum to install intensive applications.**

**If you have a limited budget, you can not have the maximum GB, that is possible.**

**With a microSD card, you can store your heaviest files.**

Source : [http://www.frandroid.com/dossiers/156820\\_guide-comment-choisir-votre-tablette-android](http://www.frandroid.com/dossiers/156820_guide-comment-choisir-votre-tablette-android)

# School tablets for poor countries

## 4. Other parameters to assess/evaluate

45

### 4.12. The « no name » tablets

Avoid tablets "no name" forgotten or unknown brands.

They are sold at unbeatable prices, however, the rates of return are very important for service and performance are rarely the appointment.

There are tablets that are about 100 euros to advise, among builders who storefront and reliable after-sales service.

Source : [http://www.frandroid.com/dossiers/156820\\_guide-comment-choisir-votre-tablette-android](http://www.frandroid.com/dossiers/156820_guide-comment-choisir-votre-tablette-android)



« no name » tablets

# School tablets for poor countries

## 4. Other parameters to assess/evaluate

46

### 4.13. Environmental and ethical aspects

#### a) Recycling

- **Bad repair and bad recycling for Tablets.**
- If possible, we need to focus on tablets that can repair itself (through the use of interchangeable modules, face to dismantle ...).
- If possible, we will favor manufacturers have provided for the recycling of their tablet (in case of breakage or failure) and tablets shock and dust.

#### b) Fair trade

- If possible, we will favor manufacturers giving wages and decent working conditions to their employees.

# School tablets for poor countries

## 4. Other parameters to assess/evaluate

### 4.13. Environmental and ethical aspects (continuation)

Lilypad, iPad case with solar panel,  
USB port and HDMI output.

<http://www.kudocase.com/>  
[http://www.lilypadcase.com/solar-ipad-  
case-features](http://www.lilypadcase.com/solar-ipad-case-features) →



#### c) "Powered by solar panel" tablet

47

- We should take, as an example, the laptop Black-Mamba2.87 \_ made by Canadian society [WeWi Computer solution](#) \_ feeding with solar panels.
- Or one should such, finding a manufacturer can manufacture covers, keyboards, with over one side of a solar panel, folding accordion (°).
- **But for now, the product we are looking for does not exist.**



Housse-clavier avec petits panneaux solaire, modèle  
"Logitech Solar keyboard Folio-3", **disponible que  
pour iPad et de très faible puissance** (25,99 €, in  
Amazon shop) →



↑ Source of image : Nigeria : [Canadian WeWi Telecommunications](#), the first solar laptop, 10/05/2014. This computer uses the [Ubuntu](#) operating system [[Ubuntu](#) is based on [Debian](#) Linux distribution, and is made and use free software (open source)]. This laptop is currently in test. Expected price ~ 300 €. <http://www.afrotechmag.com/fr/actualite/C3%A9/entertainment/nig%C3%A9ria-la-canadienne-wewi-telecommunications-le-premier-ordinateur-portable>

(°) Note: Currently, the only cover-keyboard of this type, the Solar Keyboard Folio, is only available for the iPad (It include just two solar panels powering multimedia Bluetooth keyboard). Source : <http://www.01net.com/fiche-produit/avis-redac-12467/claviers-logitech-solar-keyboard-folio/>

# School tablets for poor countries

## 4. Other parameters to assess/evaluate

### 4.14. Examples ...



7-year-old boys in Prathom 1/3 of Darakam School in Bangkok, Thailand.

<http://www.thejakartapost.com/news/2012/08/06/tablets-bring-world-learning-alive.html>



Android tablets at Chan's Creative School, Hong Kong, JUNE 13, 2012. Source :

<http://www.animoca.com/en/2012/06/photos-tablets-chans-creative-school/> & <http://www.ccs.edu.hk>



School trials cloud-computing for use with tablet. pilot project of the Braincloud System at Satainrattanaram School and in five other schools, in Nakhon Pathom province, Thailand (with Openface Internet, an Internet infrastructure and software solutions provider based in Montreal). Source :

Openface Internet, an Internet infrastructure and software solutions provider based in Montreal. Source : ASINA PORNWASIN, THE NATION November 24, 2012, <http://www.nationmultimedia.com/business/School-trials-cloud-computing-for-use-with-tablet-30194924.html>



Tablets deployment in 30 schools, in Los Angeles District, had problems when tablets were stolen (or lost) and when some students sidestepped the security system and accessed social media, online games and other content that was supposed to be blocked. Schools Learn Tablets' Limits, by STEPHANIE BANCHERO and ERICA E. PHILLIPS, Wall street journal, 14 octobre 2013. Source : <http://online.wsj.com/news/articles/SB10001424052702304500404579129812858526576>

# School tablets for poor countries

## 4. Other parameters to assess/evaluate

49

### 4.14. Examples ...



Source : Shenzhen Scope Scientific has won the bid to supply 900,000 tablet computers for school first-graders for a second time. Source : Red faces as tablet bidding reopens (updated), 13/03/2012, <http://www.bangkokpost.com/print/284150/>



Indian Government issued Android tablet called folly <http://www.slashgear.com/indian-government-issued-android-tablet-called-folly-06185893/> (Oct 6, 2011)



Thailand's One Tablet Per Child: an education leap forward. Source : Thailand News, July 23, 2012, by Areva Amy, <http://thailandnewsworth.wordpress.com/2012/07/23/thailands-one-tablet-per-child-an-education-leap-forward/>



Girls at a school in the Indian state of Rajasthan attending to the classes with Aakash tablets as their learning companions. Source : DataWind rolls out an affordable bridge to education Tech pioneer joins the Business Call to Action, United Nations Development Programme, 15 Apr 2014, <http://www.undp.org/content/undp/en/home/presscenter/pressreleases/2014/04/15/datawind-rolls-out-an-affordable-bridge-to-education-tech-pioneer-joins-the-business-call-to-action-bcta/>

# School tablets for poor countries

## 5. Conclusions

50

- It is important that the tablets are maintained, protected against shock and theft, according to the precautions in the section "4.6. Precautions. "
- It is important that users be trained to use a tablet and Android, for ½ to 1 day and appreciate its use.
- We need the software installed on the tablet are previously and seriously tested.
- Tablets must meet the needs of users (students, teachers, agronomists ...).
- Then the use of applications are requested [desired] and provided by users.
- It must be protected with an antivirus (as "Lookout" etc..).
- It should if possible have tablet 9" or 10", equipped with a keyboard case (the keyboard and adapted to country USB or micro-USB adapted to that of the connection pad).
- If possible, each student must have his.
- It must be a standard tablet, at its height, its thickness and the Android OS used (requires a true *Google Android*, easy to update regularly, and not a *proprietary* or "*home made*" *Android* ("developed at house or home")).
- It must have, as a minimum ports: 1) microUSB port, 2) microSD port, 3) the 3.5 mm jack for headphones. *And optionally, microHDMI port.*

# School tablets for poor countries

## 5. Conclusions (continuation)

51

- Must prefer a known processor (usually based on the Cortex-A9) and at least 1 GB of RAM.
- **Must not fall below 8 GB of internal memory.**
- You have to buy a tablet equipped with Google Play!
- It should not be overlooked nor connectors or useful accessories that came with your tablet (microUSB  $\Leftrightarrow$  USB cable, microSD memory card etc ....).
- Should focus on brands storefront: Asus, Acer, HP, Samsung, Sony ... Except exceptions. **But unfortunately they are also the most expensive. So it will be a compromise.**



↑ Iconia Tab A200 tablet, a profile view.

From left to right: **headphone jack**, **microUSB** and **microHDMI** connectors, and **SD card** reader (cover).  
A standardized connectique (Source : <http://www.lesandroides.net/guide-dachat-permanent-des-tablettes-android/>).

# School tablets for poor countries

## A1. Appendix: Specifications of Aakash tablets

52

Model 7 inch tablet has 1.1 GHz processor, 2 GB of flash memory, 256 MB RAM, it runs the [Android](#) Linux OS (from 2.3 Gingerbread, Android 4.1 now), it is able to connect to Internet via Wifi, it can read PDFs, and YouTube videos ... it has a slot to insert and play [read] a [microSD](#) memory card 2-32GB Its weight is 350 g (12 oz). It has no camera.

The **Aakash** has an overall size of 190.5 x 118.5 x 15.7 mm with a 7" screen resistive, weighing 350gms and using the Android 2.2 operating system with access to the market exclusive **Getjar (a captive market. No access to the wider Android Market \_ on Google Store \_)**, developed by DataWind.

While the other, Ubislate 7 +, provides access to Google store (that is to say all the Android market).

**So all these parameters must be therefore carefully consider!**

52

# School tablets for poor countries

## A1. Appendix: Specifications of Aakash tablets (continuation)

53

Specifications	Aakash	UbiSlate 7+
Price	Rs.2,500	Rs.2,999
<a href="#">Central Processor</a> speed	Arm11 – 366Mhz	Cortex A8 – 700 Mhz
Random Access Memory (RAM)	256 MB RAM	256 MB RAM
Battery	2100 mAh	3200 mAh
OS	Android 2.2 Froyo	Android 2.3 Gingerbread
Network	WiFi	WiFi & GPRS Phone network
Made in	India	Taiwan

These data are for 2011.

According to some sources, the tablet UbiSlate 7 + is made in Taiwan and not in India.  
This is another point to check.

53

# School tablets for poor countries

## A2. Appendix: suggestion of free software and application

54

### For the kids :

Jouer à la cuisine (in French).  
Kids learn (in English).  
Cris d'Animaux (in English).  
Perfect piano (in English).  
Real guitar (in English).  
Real violin (in English).  
Plant quiz (in English).  
Cool school lite (in English).  
Logiciels de tables de calcul & quiz (in English).  
[Tangram HD](#) (Free with pub, Fr).  
[Memory](#) (Free with pub, En\*).  
[ABCdaire](#) (Free with pub, Fr).  
[Défis calculs](#) (Free with pub, Fr).  
[Times Table](#) (Free , En\*).  
[Pays du monde](#) (Free , Fr).  
[ArboLOGI](#) (Free , Fr).  
[M-EOL: a biodiversity game](#) (Gratuite, En).

### Ecological techniques and gardening :

Permaculture (in English).  
Mon potager (in French).  
La Main verte (in French).  
Les saisons du jardinage (in French).  
Fruits & légumes de saison (in French).  
L'arrosoir : jardins & potagers / gardening (in French).  
Botanic : jardinage / gardening (in French).  
Greenpeace news (in English).  
Land Water \_ irrigation techniques (in English).  
Eto Calc \_ irrigation techniques (in English).  
Waterbot: Plants watering : plants drip (in English).  
Sustainable living (in English).

On the screen of the tablet, is shown a data sheet of the "**Practical Action**" British NGO (PDF) →



# School tablets for poor countries

## A2. Appendix: suggestion of free software and application (continuation)

55

### Essential oils, aromatherapy, medicinal plants:

- Essential Oils Pedia (in English).
- Natural essential Oils (in English).
- Aromaguide (in French).
- Le Tisanier (in French).
- Précis de phytothérapie (in French).
- Edible & medicinal plants (in English).
- Précis de phytothérapie.

### On trees and botanical:

- Quel est cet arbre ? (in English).
- Tree identification (in English).
- Clé de forêt (ONF) (in French).
- Bois & forêts (in French).
- Boletus (full version) \_ dico champignons (in French).
- Champignons free (full version) \_ dico champignons (in French).
- Tropical house plants (in English).

### rescue, relief:

- First Aid (in English).
- First Aid, British Red Cross (in English).
- Croix rouge, l'application qui sauve (in French).

### Office and miscellaneous:

- Google translator (in English).
- Google search (in English).
- Google Organizer (in English).
- Google traducteur (in French).
- Google recherche (in French).
- Google Agenda (in French).
- Google Maps (in French or English).
- Google earth (in French or English).
- Google gmail (in French or English).
- Google hangouts (in French or English).
- Google Flux d'actualité (in French).
- Google Chrome Navigateur (in French).
- Mobile Tag QR code Flashcode (in French).
- Document to Go Full version (in French).
- YouTube (in French).
- Aldiko eBooks reader (in French).
- World bank data finder (données économiques) (in French).
- Shake calculator (in English).
- Speak english (in English & Français).
- English training (in English & Français).
- Dailymotion,
- Facebook,
- Twiter.

# School tablets for poor countries

## A3. Appendix: update the document database

56

- **Provision of an “*international base*” rich in documents produced and supplies informational data managed by an NGO community.**
- The basis of documentary for the sustainable development of developing countries data is copied to the microSD memory card (inserted into the corresponding port on the tablet) of each tablet.

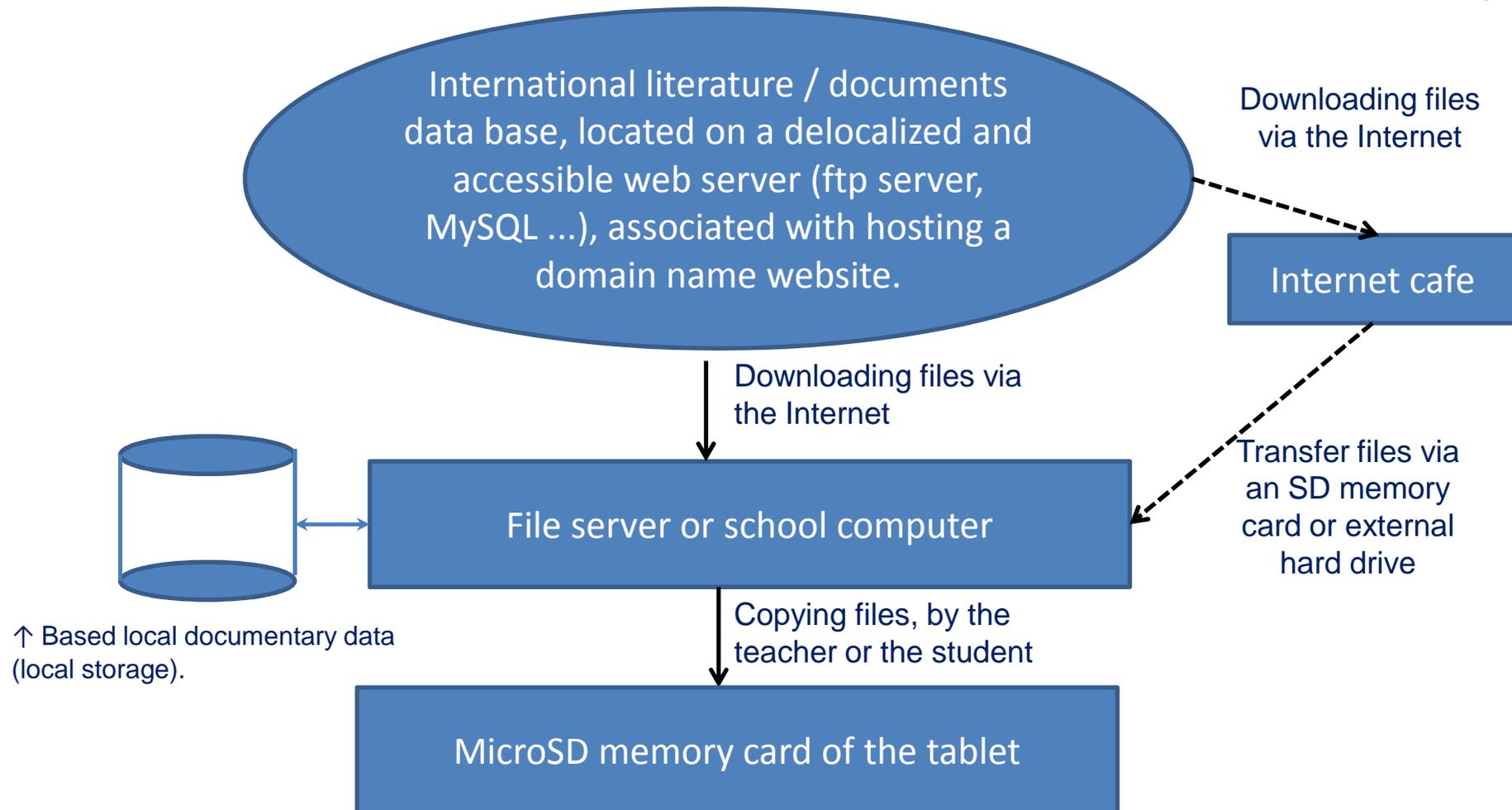
### Thinking:

- For this documentation, we think we chose this to be done in the proposed on-line website, including, for its users, search for a file or video option in this database.
- Note: This can help us in achieving the retrieval interface is believed to be implemented in order to promote research and indexing of documents in this project and will be available online after free.
- Should be found after a name for this application or search interface. this will help to promote and popularize the documentary database.
- For copyright issues, you will see that after the launch of the application.

# School tablets for poor countries

## A3. Appendix: update the document database (continuation)

57



You can have an indication (or idea) the content of this document database, with clicking on these 2 links:

<http://benjamin.lisan.free.fr/developpementdurable/Liste-fichiers-DVD.txt>

<http://benjamin.lisan.free.fr/developpementdurable/Contenu-DVD.txt>

# School tablets for poor countries

## A4. Appendix: for more ...

58

### In English :

1. Tablet computer, [http://en.wikipedia.org/wiki/Tablet\\_computer](http://en.wikipedia.org/wiki/Tablet_computer)
2. Best tablet 2014: Our top 10 ranking, [Gareth Beavis, http://www.techradar.com/news/mobile-computing/tablets/10-best-tablet-pcs-in-the-world-today-1079603](http://www.techradar.com/news/mobile-computing/tablets/10-best-tablet-pcs-in-the-world-today-1079603)
3. Tablet computers review, <http://www.choice.com.au/reviews-and-tests/computers-and-online/mobile-computers/tablet-computers/tablet-computers-review-and-compare.aspx>



↑ Source: **Qelasy**, the Ivorian educational tablet created by Thierry N'Doufou. This tablet has been designed to adapt to different climates of Central and West Africa and is equipped with a dust filter and a waterproof shell. It does not access Google store, but access a local database, fueled by teachers at the school (this is a solution may be closed at the application level (?). To test and check). <http://www.ecoguide-it.com/qelasy-la-tablette-educative-africaine-1137888>

# School tablets for poor countries

## A4. Appendix: for more ... (continuation)



59

### In English :

A [Lenovo X61](#) in slate mode

- The 10 Best Tablets, [WENDY SHEEHAN DONNELL](#), JUNE 9, 2014, <http://www.pcmag.com/article2/0,2817,2413145,00.asp>
- Find out why apps are incompatible with your Android device, Martin Brinkmann, 2013, <http://www.ghacks.net/2013/05/06/find-out-why-apps-are-incompatible-with-your-android-device/>
- How to Install Incompatible Apps on your Android Device from Google Play, <http://www.wtfdiary.com/2013/01/how-to-install-incompatible-android.html>

### In French :

1. Guide : Comment choisir votre tablette Android ?, [Marie](#), le 03 aout 2013 à 14:00, [http://www.frandroid.com/dossiers/156820\\_guide-comment-choisir-votre-tablette-android](http://www.frandroid.com/dossiers/156820_guide-comment-choisir-votre-tablette-android)
2. Guide d'achat 2014 des tablettes Android, Thierry Lévy-Abégnoli, 14 juin 2014, <http://www.lesandroides.net/guide-dachat-permanent-des-tablettes-android/>
3. Introduction à Android, Jean-Michel Douin, 26/09/2012, [http://www.esiee.fr/~bureau/Unites/In413/1213/Docs/Android\\_Introduction\\_1\\_56.pdf](http://www.esiee.fr/~bureau/Unites/In413/1213/Docs/Android_Introduction_1_56.pdf)
4. [Android : le guide ultime, de débutant à expert](#), Jean-Louis Dell'Oro et Michael Picard, Amazon, 2013 (e-book Kindle, 1,99 €).



Comparison of several mini tablet computers: [Amazon Kindle Fire](#) (left), [iPad Mini](#)(center) and [Google Nexus 7](#) (right) ↑

# School tablets for poor countries

## A4. Appendix: Glossary

60

**Open source** is a kind of [software](#). It is different from other software because the [source code](#) is available to everyone. The source code is a set of instructions for the computer, written in a [programming language](#). Anyone can see how the source code works and can change it if they want to make it work differently. The [opposite](#) of open source is [closed source](#). Closed source software is not available to everyone. Open source has a lot in common with [free software](#) but each has its own focus and goals.

Open source and [free software](#) have been around for [decades](#). They became more popular with the [Linux](#) and [BSD](#) software [communities](#). To protect the code, a special [user license](#) is used. The most common kinds of licence are the [GPL](#), [BSD](#) and [LGPL](#). [Wikipedia](#) uses open source too. The Open Source Movement is led by the [Open Source Initiative](#). The open source movement became separate from the [Free software](#) movement in 1998. Source : [http://simple.wikipedia.org/wiki/Open\\_source](http://simple.wikipedia.org/wiki/Open_source) & <http://opensource.org/>

**Linux** ([/iˈlɪnəks/ LIN-əks](#) or [/ˈliːnʊks/ LEE-nuuks](#)) is a [Unix-like](#) and mostly [POSIX-compliant](#) computer [operating system](#) assembled under the model of [free and open source software](#) development and distribution. The defining component of Linux is the [Linux kernel](#), an [operating system kernel](#) first released on 5 October 1991 by [Linus Torvalds](#). The [Free Software Foundation](#) uses the name *GNU/Linux*, which has led to some [controversy](#). Linux was originally developed as a free operating system for [Intel x86](#)-based personal computers. It has since been [ported](#) to more computer hardware platforms than any other operating system.<sup>*[citation needed]*</sup> It is a leading operating system on [servers](#) and other [big iron](#) systems such as [mainframe computers](#) and [supercomputers](#).<sup>[18][19][20]</sup> As of June 2013, more than 95% of the world's [500 fastest supercomputers](#) run some variant of Linux, including all the 44 fastest.

Source : <http://en.wikipedia.org/wiki/Linux>

# School tablets for poor countries

## A4. Appendix: Glossary

61

**Android** : is a [mobile operating system](#) (OS) based on the [Linux kernel](#) that is currently developed by [Google](#). With a [user interface](#) based on [direct manipulation](#), Android is designed primarily for [touchscreen](#) mobile devices such as [smartphones](#) and [tablet computers](#), with specialized user interfaces for televisions ([Android TV](#)), cars ([Android Auto](#)), and wrists ([Android Wear](#)). The OS uses touch inputs that loosely correspond to real-world actions, like swiping, tapping, pinching, and reverse pinching to manipulate on-screen objects, and a [virtual keyboard](#). Despite being primarily designed for touchscreen input, it also has been used in [game consoles](#), [digital cameras](#), and other electronics.

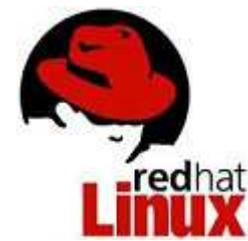
Source : [http://en.wikipedia.org/wiki/Android\\_\(operating\\_system\)](http://en.wikipedia.org/wiki/Android_(operating_system))

**Ubuntu** : ([/u:'bu:ntu:/ uu-BUUN-too](#))<sup>[7][8][9]</sup> is a [Debian-based Linux operating system](#), with [Unity](#) as its default [desktop environment](#) ([GNOME](#) was the previous desktop environment). It is based on [free software](#) and named after the Southern African philosophy of [ubuntu](#) (literally, "human-ness"), which often is translated as "humanity towards others" or "the belief in a universal bond of sharing that connects all humanity".<sup>[10]</sup> According to some metrics, Ubuntu is the most popular [desktop Linux](#) distribution to date. See [Installed base](#) section. Development of Ubuntu is led by [Canonical Ltd.](#),<sup>[11]</sup> a company based on the [Isle of Man](#) and owned by South African entrepreneur [Mark Shuttleworth](#).

Source : [http://en.wikipedia.org/wiki/Ubuntu\\_\(operating\\_system\)](http://en.wikipedia.org/wiki/Ubuntu_(operating_system))



[Tux](#) the penguin, mascot of Linux



# School tablets for poor countries

62

For further information :  
Benjamin LISAN  
Tel : +(33) 6 16 55 09 84  
Email : [benjamin.lisan@free.fr](mailto:benjamin.lisan@free.fr)



↑ 11 tablets and their accessories  
and their keyboards, offered by the  
author to the Beninese Association  
[AJEDD](#), on site, in Benin.