

# Is the One Laptop Per Child Project the Way to Bridge the Global Digital Divide?

Michael Smith

Intuitively, it seems a bizarre idea: that the best way to help the developing world is to sell countries thousands of strange-looking green laptops. But that is the dream of the One Laptop Per Child (OLPC) foundation (1). We live in a world characterised by massive inequality and widespread poverty—in 2001, the World Bank estimated that 2.7 billion people were living on less than \$2 (£1) a day (2). The resulting disparity in access to information technology, the so-called “digital divide”, is a seemingly minor implication, and yet this is the problem that the OLPC foundation has set out to address.

When many lack food, healthcare or housing, access to IT may seem unimportant, but it impacts greatly upon the capacity of a society to achieve economic development (3): inequality of development between nations brings with it inequality of access to the means of bringing about development. The OLPC hopes that their laptop, the ‘XO’, will enable an improvement in developing world education, using Internet access and pre-installed software and resources (1).

Internet access is an important feature of the new laptops, giving access to learning resources as well as a connection to the wider world. However, supply can pose a problem; a Nigerian school in a major XO field trial has been forced to terminate its link due to the \$350 (£180) monthly

---

## The Indian Minister for Education has labeled the scheme as “pedagogically suspect”

---

cost of the satellite connection (4). Some IT schemes have used pseudo-connections to the Internet, with a wifi-enabled vehicle making the rounds and automatically on- and offloading Internet content and emails as it passed through each village (5), or with several villages connected indirectly to the net via a central relay box. These can greatly decrease cost (6), so problems with Internet supply need not sound the XO’s death knell.

As far as hardware goes, the XO is excellent, being easy to maintain (4), given some expertise and a supply of parts. It is rugged and uses little power, and can be charged using a manually powered “rip-cord” charger (1). Various other projects aiming to put technology in the developing world have designed machines, such as the Jhai PC (7) and the Desert PC, (8) with similar considerations in mind, and can complement or act as alternatives to the OLPC scheme.

Damage, theft, loss and illicit sale are problems, with 40 out of 300 missing in action over the five months of the trial in Nigeria (4). This problem is increased by the emphasis on personal ownership of the laptops by schoolchildren, who are allowed to take them

home with them, to encourage home learning.

There is also purchase cost to consider: in some parts of the world the annual expenditure on a child’s education comes to less than \$20 (1), so one has to wonder whether a laptop costing around £90 (3) is a wise investment. Even its usefulness is not certain—the Indian Minister for Education has labeled the scheme as “pedagogically suspect” (9), and there are mixed results coming from research into the effects of computer use upon learning (10). In particular, the assertion in the International Handbook of Mathematics Education that “the belief that computers will facilitate learning on their own has been seriously eroded” in recent years (11) seemingly runs counter to the OLPC ideal.

Perhaps the most fundamental problem with the OLPC initiative, however, is that the digital divide affects far more than education, and projects aimed at the wider problem might be more cost-effective. The Internet is also vital for the dissemination of important information and resources, such as medical journals (12), and the computer has a central place in the modern business world and communication, not to mention adult learning. The XO, which is designed solely for school-based education, is only attempting to address one part of the problem. Education is inarguably important, but other projects, taking a more general-purpose approach, may well provide better all-round solutions.

Computers *per se* are not the only option; the use of mobile phones in the hands of local businesspeople and farmers has met with great success in some areas, and continues to be developed, filling the niches which we are used to conventional computers occupying, thanks to their ever-increasing onboard processing power, software and information storage capacity (13), and provides significant economic benefits, as well as playing an increasingly important social role.

In other cases, access to IT can be provided to



communities in the form of communally or business owned PCs (7, 14) or handsets (15). In the case of the Jhai PC (7), each village owns an internet-connected PC which can be used by all. For larger communities, businesses with IT resources for hire, such as internet cafés or internet-enabled smartphones can provide a more financially sustainable alternative than the XO. And an advantage of such solutions is a vastly decreased per user setup cost, which can be covered from a village's collective funds or from micro-loans from local businesses (18). Maintenance can also come from the private sector, if they have access to a basic level of training. The introduction of IT resources can therefore be not only a civic act but a driver for economic development. Here I agree with the creators of the not-for-profit Ndiyo system, who argue that their model for bridging the digital divide is "more pragmatic" and "sustainable" than the OLPC project (14).

The XO does, however, represent an important step in the development of IT-based educational solutions for developing nations. As an example, a spin-off of the OLPC foundation,



Pixel Qi (17), is working with the foundation and hopes to eventually create machines retailing at \$75 (£40). As they put it, "What computing can be, the XO was just the first step."

There are various alternatives to the XO being rolled out to suit varied situations (18, 19). A major factor in this will be different social norms, cultures and common knowledge bases (20). Commentators point out, for instance, that in many cultures, unlike the West, the perceived basic unit of society is not the individual, but larger groups such as the family or community; under these cultural norms, the likes of the Jhai PC (7) collective ownership model would seem more appropriate than the OLPC's approach, which is based upon the ideal of individual ownership. Certain IT services are also affected by religious concerns; for instance, Sharia

law regarding lending and interest rates may affect telecom payment schemes, and this needs to be taken into account (20). Uses of IT equipment which differs from accepted norms, have already been observed (13), as in the inclusion of compasses that point to Mecca in mobile phones (20). In addition, any such scheme must be indefinitely sustainable without aid from outside agencies to be successful.

In conclusion, the XO appears to be an important step

---

### "What computing can be, the XO was just the first step"

---

in development and raising public awareness of IT-based educational aids in the developing world, but one currently hampered by cost and sustainability issues, whilst addressing only part of the digital divide. There is probably no single path to a universal Information Age that will suit all cultural norms, existing infrastructure, economic resources and practical needs. An important theme in these projects is sustainability, and their use to expedite economic development, as in the provision of micro-loans (16) to buy equipment, and the hiring out of computers and computer time. Successful projects may deviate significantly from existing models of computer use, as in the use of mobile phones instead of computers (13). If the digital divide is to be spanned, it looks to be these projects, and not the OLPC, which make up the bridge.

Michael Smith is a 2<sup>nd</sup> year reading Biological Natural Sciences at Girton College

#### References:

1. OLPC, [laptop.org/en/vision/mission/index.shtml](http://laptop.org/en/vision/mission/index.shtml)
  2. World Bank *Poverty analysis* [go.worldbank.org/K7LWQUT9L0](http://go.worldbank.org/K7LWQUT9L0)
  3. Ishaq A., *Finance & Development*, **2001** Sept; Vol.38, No. 3
  4. BBC news **2007** [newsvote.bbc.co.uk/1/hi/technology/7115348.stm](http://newsvote.bbc.co.uk/1/hi/technology/7115348.stm)
  5. *New York Times* **2004** <http://www.nytimes.com/2004/01/26/technology/26oxcart.html>
  6. *The Economist* **2002** [http://www.economist.com/science/displaystory.cfm?story\\_id=E1\\_TPVNRSV](http://www.economist.com/science/displaystory.cfm?story_id=E1_TPVNRSV)
  7. Jhai PC, [www.jhai.org](http://www.jhai.org)
  8. Geekcorps *Desert PC* [http://www.geekcorps.org/files/iesc\\_geekcorps\\_desert\\_pc.pdf](http://www.geekcorps.org/files/iesc_geekcorps_desert_pc.pdf)
  9. BBC news [newsvote.bbc.co.uk/1/hi/technology/7094695.stm](http://newsvote.bbc.co.uk/1/hi/technology/7094695.stm)
  10. Goldberg, A. et al., *J. Technol. Learn. Assess.* **2003**, 2, No. 1.
  11. *International Handbook of Mathematics Education*; Bishop, A.J.; Springer, Berlin, Germany, 1996; p 470.
  12. *BMJ.* **2003** February 1; 326(7383): 238 [pubmedcentral.nih.gov/articlerender.fcgi?artid=1125110](http://pubmedcentral.nih.gov/articlerender.fcgi?artid=1125110)
  13. Donner, J. *The Information Society* **2008** (in submission).
  14. Ndiyo, [www.ndiyo.org](http://www.ndiyo.org)
  15. Simputer, [www.simputer.org/simputer/](http://www.simputer.org/simputer/)
  16. *Stanford Business Magazine* **2005** [www.gsb.stanford.edu/news/bmag/sbsm0511/feature\\_microfinance.shtml](http://www.gsb.stanford.edu/news/bmag/sbsm0511/feature_microfinance.shtml)
  17. Pixel Qi, [pixelqi.com](http://pixelqi.com)
  18. Goth, G. *IEEE Internet Computing* **2005**, 9, 8–11.
  19. BBC News 2004 [news.bbc.co.uk/1/hi/business/3535583.stm](http://news.bbc.co.uk/1/hi/business/3535583.stm)
  20. Tongia, R. at Telecommunications Research Policy Conference, **2006** [web.si.umich.edu/tprc/papers/2006/512/ConnectivityDigitalDivide.pdf](http://web.si.umich.edu/tprc/papers/2006/512/ConnectivityDigitalDivide.pdf)
- All currency conversions made using Coinmill.com*