Lean, Green, **Learning** machine

A Guide for teachers new to the One Laptop Per Child XO

- OLPC Overview/background

- Uses for learning?

- The XO at My Primary School

- My rollout strategy

- Student responses/ evidence

- Appendix and resources

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This laptop, and how students interact with it, is *different*

1 → ☓
vision | laptop | participate | children

"Give a man a fish & he'll eat for a day.
Teach a man how to fish & he'll eat for a lifetime".

OLPC Mission:

OLPC Australia's mission is to create educational opportunities for the country's disadvantaged children by providing each child with a rugged, low-cost, low power, connected laptop (the XO) whose hardware & software have been designed especially for kids.

As in many other developed nations, there are stark differences in the quality of life experienced in Australian rural & remote regions (heavily populated by indigenous people) & metropolitan areas. This has led to an enormous disparity between the life expectancy & achievements of indigenous & non-indigenous people.

The 2008 National Assessment Program: Literacy & Numeracy (NAPLAN) study showed that in metropolitan areas 58.8 per cent of indigenous eight-year olds were above the minimum national standard in reading, while in very remote areas this figure was just 12.7 per cent. Clearly, the issue is not race or colour, but environment - the current system of teaching does not engage rural children or their teachers as well as their peers in metropolitan areas.

Based on five core principles & decades of research, OLPC Australia has developed a sustainable solution to address this critical issue in our community, & its mission is to see it implemented across the nation.

History of OLPC and the Australian mission:

- January 2005 - cheap student-friendly laptop first proposed by OLPC founder Nicholas Negroponte
- November 2005 - first prototype demonstrated
- September 2006 - Sugar student-friendly operating system first demonstrated
- November 2006 - first Laptops roll off production line
- February 2007 - first beta machines in student hands
- November 2007 - first 'give one get one' fund raiser a huge success.
- **January 2008 - OLPC Australia formed**
- May 2008 - work on new version of the XO begins
- **May 2009 - first Australian rollouts announced** (Northern Territory & Queensland)
- Over 1.3 million deployed worldwide so far
- Late 2009 - version 1.5 of the XO to be deployed
- 2010 rollouts going ahead in conjunction with the 'Windows of Opportunity' drive.

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vision

Five OLPC Core Principles:

1. Child Ownership

OLPC has created the XO laptop to be very low cost, robust & powerful, beautiful & friendly. It has been designed explicitly for children of the elementary classes, the first one of its kind. The ownership of the XO is a basic right of the child & is coupled with new duties & responsibilities, such as protecting, caring for, & sharing this valuable equipment. A laptop can be transformed into a mobile school: a portable learning & teaching environment. A connected laptop is more than a tool. It is a new human environment of a digital kind. A key OLPC asset is the free use of the laptop at home, where the child (& the family) will increase significantly the time of practice normally available at the standard computer lab in the school.

2. Low Ages

The XO is designed for the use of children of ages 6 to 12-covering the years of the elementary school-but nothing precludes its use earlier or later in life. Children don't need to write or read in order to play with the XO & we know that playing is the basis of human learning. Moreover those digital activities will help the acquisition of the writing & reading skills.

3. Saturation

The OLPC commitment is with elementary education in the developing countries. In order to attain this objective we need to reach a "digital saturation" in a given population. The key point is to choose the best scale in each circumstance. It can be a whole country, a region, a municipality or a village, where every child will own a laptop. As with vaccination a digital saturation implies the continuous intervention on the successive cohorts at the proper ages.

4. Connection

The XO has been designed to provide the most engaging wireless network available. The laptops are connected to each other, even when they are off. If one laptop is connected to the Internet, the others will follow to the web. The children in the neighborhood are thus permanently connected to chat, share information on the web, gather by videoconference, make music together, edit texts, read e-books & enjoy the use of collaborative games on line.

5. Free & Open Source

The child with an XO is not just a passive consumer of knowledge, but an active participant in a learning community. As the children grow & pursue new ideas, the software, content, resources, & tools should be able to grow with them. Each child with an XO can leverage the learning of every other child. They teach each other, share ideas, & through the social nature of the interface, support each other's intellectual growth. Children are learners & teachers. In our context of learning where knowledge must be appropriated in order to be used, it is most appropriate for knowledge to be free.
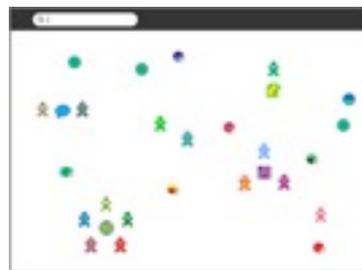
The XO is not designed for one user doing multiple tasks, but multiple users doing one task together.

laptop

What is the XO laptop?

Hardware (version 1):

The XO is Linux-based, with a dual-mode display—both a full-color, transmissive DVD mode, and a second display option that is black and white, reflective, and sunlight-readable at three times the resolution. The laptop has a 500MHz processor and 256MB of DRAM, with 1 GB of Flash memory; it does not have a hard disk, but it does have three USB ports and an SD-card slot for expansion. The laptops have wireless broadband that, among other things, allows them to work as a mesh network; each laptop is able to talk to its nearest neighbors, creating an ad hoc, local area network. The laptops are designed to be extremely power efficient, enabling the use of innovative power systems (such as solar, hand-crank and pedal-power).

Software:

Philosophy - Epistemologists from John Dewey to Paulo Freire to Seymour Papert agree that you learn through doing. This suggests that if you want more learning, you want more doing. Thus OLPC puts an emphasis on software tools for exploring and expressing, rather than instruction. Love is a better master than duty. Using the laptop as the agency for engaging children in constructing knowledge based upon their personal interests and providing them tools for sharing and critiquing these constructions will lead them to become learners and teachers.

Interface: the Sugar OS - is a "zoom" interface that graphically captures their world of fellow learners and teachers as collaborators, emphasizing the connections within the community, among people, and their activities. The Neighborhood view displays all the connected XO laptops within a child's community, and their shared activities. This provides a great space for discovering new things and making new friends. There are no software or programs, only 'activities'. All work is auto-saved into a unique journal space to which students can return at any time.
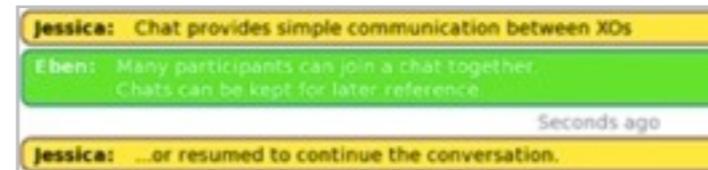
Sample of dedicated learning activities:

Write is a basic text editing application featuring straightforward tools and a simple interface. It provides an easy way for children to write a story, craft a poem, or complete an essay, as well as more advanced features like image insertion, table creation, and layout operations. It also features collaborative real-time editing, so a group of children can work together to edit text easily and seamlessly.
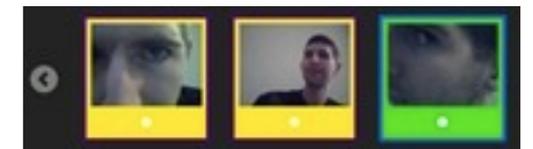
The **Chat** activity provides a simple environment for discussion, whether it's between two individuals or an entire classroom.

Jessica: Chat provides simple communication between XOs
Eben: Many participants can join a chat together. Chats can be kept for later reference.
Seconds ago
Jessica: ...or resumed to continue the conversation.

Read is a basic PDF or document viewer. Providing basic controls for page navigation and a variety of zoom tools, it makes it easy to read a book in either laptop or handheld tablet modes. It allows use of the thousands of free e-books available from sites such as Project Gutenberg.

The **Record** activity provides a simple way for children to take pictures, view slideshows, and record video and audio. Children can record together to create collaborative photo albums over the network.

Calculate provides a generic calculator with a simple, straightforward interface. Designed to be intuitive for even the youngest children, it also supports advanced mathematics and boolean logic. An innovative "labeling" feature allows children to solve problems collaboratively and understand correlations between the numbers and what they represent.

Browse is a simple Web application that allows children to access the Internet and share links among their friends.
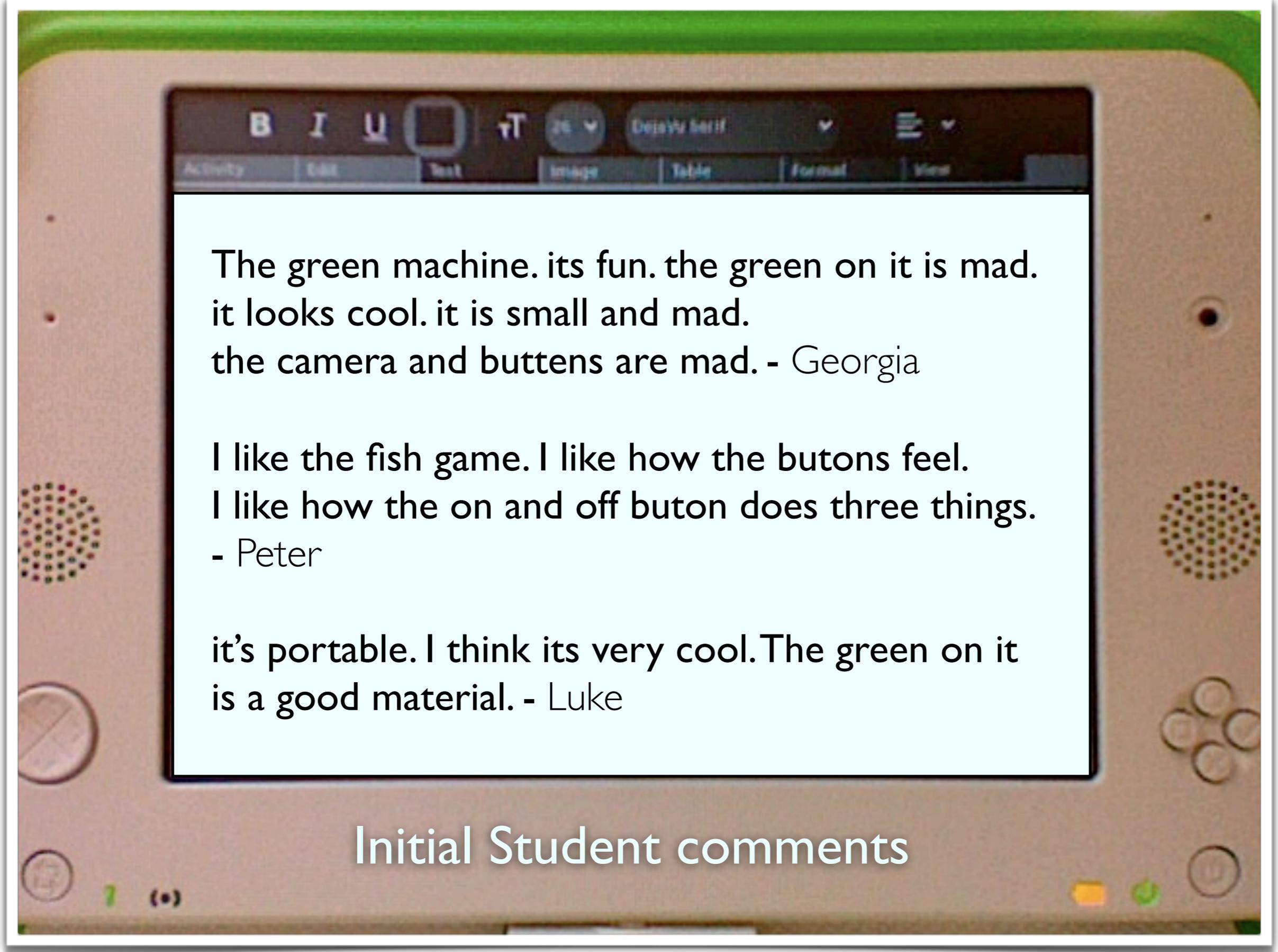
TamTam Jam is a fun, powerful way to perform music, play instruments, and collaborate musically with other children. It offers simple yet sophisticated ways to create loops, synchronize rhythms, and put on a concert.

Distance is a two-laptop collaborative activity that can be used to measure the distance between them.

The green machine. its fun. the green on it is mad.
it looks cool. it is small and mad.
the camera and buttens are mad. **-** Georgia

I like the fish game. I like how the butons feel.
I like how the on and off buton does three things.
- Peter

it's portable. I think its very cool. The green on it
is a good material. **-** Luke

Initial Student comments

SUGGESTED ROLLOUT STRATEGY:

1. **Pre-rollout**: learning vision

2. Peer trainers and laptop literacy

3. Play/ informal learning

4. Formal/ planned learning

5. iLearn personalised learning draft plan

This suggested rollout strategy has been developed from hands on use of the XO in a Queensland year 4 classroom, as well as from the published thoughts of other XO users and 1:1 laptop practitioners and incorporates principles of the Education Queensland Smart Classrooms strategy. Please adjust as necessary depending on the age and needs of your unique cohort of students.

MY ROLLOUT STRATEGY:

1. **Pre-rollout:** learning vision

A major factor in the success of any laptop rollout is determined by the school's overriding vision for learning. The OLPC project provides an extensive vision (see page 6) but each school receiving XOs needs to first reflect on these and how they fit with existing ways of working, learning goals and curriculum. Within your usual school decision-making process, work through Questions such as:

    (1) What is your school's existing learning vision?

    (2) Does it incorporate the ideas of collaboration and sharing that the XO is built around?

    (3) Where is your school already at on its journey with the Smart Classrooms framework and implementing digital pedagogy that goes beyond just doing old things in new ways?

    (4) Discuss the 1:1 'Miracle transformation fallacy' statements by Mark Warschauer (see appendix)

    (5) How will the introduction of laptops potentially change the school's existing learning vision?

    (6) Are teachers able to work with a program where students become co-experts/ self-directed learners?

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2. **Peer trainers and laptop literacy**

    (1) Select suitable peer helpers and explain their role.

    (2) Allow them to choose a cool name to identifiy themselves in their helper role.

    (3) Mini-lessons for initial laptop literacy (see appendix) have been developed to ensure students acquire safe operational knowledge of the XOs hardware, software and interface.

    (4) Run peer helpers through mini-lesson A, and train them so they can conduct the mini-lessons with other students.

    (5) Sit with peer trainers through their initial delivery of mini-lesson A.

    (6) Show peer helpers through mini-lessons B, C and D so they can begin training students in these also. (see appendix)

    (7) Class discussion regarding 'Cyber-behaviour' - ie. same rules apply - discuss scenarios, get class agreement.

3. Play/ informal learning

A. After following the set mini-lessons from phase one, students should be allowed 20 minute periods where they can just play with the XOs activities and practice what they have learned.

B. Also during this period, one or more days of regular teaching should be set aside for this challenge-based learning task:

Old things in new ways:

- with each student having access to an XO, members of the class should be encouraged at each part of the day to reflect on how could an XO activity be used to complete, extend or enhance

New things in new ways:

- after a day or more of this has been completed, students should also be given the chance to discuss what new things could be incorporated into their class's daily learning that weren't possible before?

4. Formal/ planned learning

Once phases one and two are complete, the class is ready to begin using XO activities as a normal and planned part of their everyday learning. To this end, formal learning with that incorporates the capabilities of the XO can be based on

A. what worked from the 'Old things in new ways' task, and

B. what ideas from the 'New things in new ways' activity ...

See the Appendix for sample lesson outlines ('Intro to Writing Poetry', 'Chance & Data') generated from this process.

iLearn

OLPC XO with learning support students program

PERSONALISED, CHALLENGE-BASED LEARNING, teaching students *how to learn.*

GOAL: create self-learning students who can reflect and become addicted to learning

Tullawong State School

DEMONSTRATE phase

Reveals students strengths & weaknesses via existing school data:
- NAPLAN
- Even Start tool
- EMM
- PROBE running records
- Etc.

Re-DEMONSTRATE
- Re- use original data tool

Challenge PHASE 1
- Scaffolded analysis of data with students
- Choose 1 Strength & 1 weakness
- Research apps or activities that will help
- Motivation? - constructively engaged, plus students get to personalise own learning with XO

Doing PHASE 1
- Use chosen app/ activity to improve chosen strength & weakness
- Practice time - LS sessions, and/or own time
- Informally evaluate progress

Doing PHASE 2
- Use NEW chosen app/ activity/ podcasts etc. to improve chosen strength & weakness
- Practice time - LS sessions, and/or own time
- Informally evaluate progress

Challenge PHASE 2
- Scaffold formal evaluation of Doing Phase 1.
- What other tools can help?
  - Podcasts?
  - Pencasts?
  - Other?

EXTRAS:
- Project - Should the school get more?
- Why/Why not?
- How would this be achieved?
- Compose letter to P&C for funds etc.

NEED:
- WiFi access to EdQ network
- Student Helpers ('Angels')
- Student usage agreement for XO & student iLearn plan
- Curriculum links document

FUTURE:
- Extended infrastructure - WiFi, Moodle server
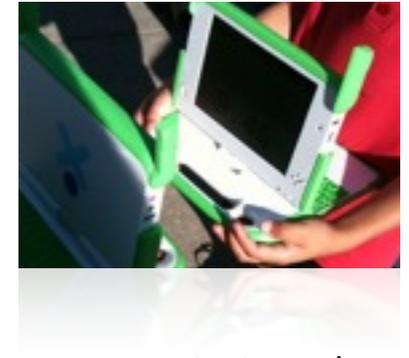- More XO's (1.5), Smartpens
- Charging trolley's

Appendix:

- Reflections on XO classroom use
- 'Miracle Transformation Fallacy' discussion challenge

- sheets for use by student helpers
- mini-lesson cards
- 'how to show XO to kids' sheet
- Lesson Outline: writing task using 'Joke Machine'
- Lesson Outline: using 'Slider Puzzle' to collect random data

Reflections on classroom use of the XO by Jonathan Nalder (jnxyz@mac.com)

This reflection is meant to give an overview of one teacher's experiences with using the XO with students in a real life classroom. Largely on our own, we developed an implementation guide for other teachers to follow, as well as some lesson plans for using the XO not just to assist but to *transform* learning. Although based close to a major capital city, & thus not an exact match for what classrooms in third-world & remote communities might be like, our XO class is from a lower-socio economic area with a high proportion of indigenous students, in an old classroom with limited technology infrastructure.

First impressions (after **one** week): Firstly, as the only designed-for-kids-first device of its kind, its a wonderful wonderful machine. Unlike some organisations whose rhetoric uses all the right buzz words but fails when it comes to living up to them, the XO device really does encourage creating, sharing and connecting just by its very design. I've only had limited time with two XOs in connected mode so far, but they are so easy to hook up via their built-in mesh networking that almost every activity can be shared between multiple students. This includes co-writing or drawing, or even controlling each others camera, or using the sonar sound activity to measure distance between machines. It really is the learning theory of connectivism personified in a device.

Even the Sugar OS that they run has an interface of brilliant simplicity, with every activity running full screen and auto-saving, while a 'journal' of every activity they have done is accessible with just one button push. I'm looking forward to using them outside regularly thanks to the special LCD screen they have that allows full readability in sunlight.

Further impressions (after **six** weeks): Although limited to 12 XOs in a class of 27, I have seen the potential of the XO to transform learning first hand. Students (although not all) take to the machines and learn them very quickly, or are at least prepared to help each other, a great development that makes it easier for the teacher if you're willing to give up some feeling of control in this area. The mesh networking/sharing means that every activity has the potential for extension built-in, and students themselves are often coming up with innovative and new ways to use the XO for their learning.

The XO itself is in need of an upgrade and does struggle at times and suffer from known faults like the trackpad skipping or freezing up, and some activities refusing to close or hanging, requiring a restart. We also sometimes had problems connecting more than two machines at a time for sharing, not sure why. Battery life proved shorter than expected, so dimming of the screen/ sleep mode do need to be aggressively used. Our 'uptime' overall was probably 90% for each machine though, and when the previous amount of technology in a class is 3 old PC's, just having such student-friendly, adaptable and capable machines has proven a huge step forward. Our implementation program of training a small group of 'XO experts' who then manage the laptops and train the other students has worked brilliantly. This lightens teacher workload while also empowering the students who are more than capable. The lesson plans we have developed have also worked well.

Even further impressions (after **12** weeks): In this phase we have now had access to 27 XO's (a full class set) which has enabled us to test out their full potential. We have also been able to source enough extra school funds to get some XO-specific furniture like small tables and floor cushions as having laptops enables the kids to learn anywhere in the room, not just in the traditional rows of desks. Our experience with the XO's has improved greatly with some help from Rangan at OLPC Australia who supplied info like how to reset the trackpad when it freezes, as well as a list of activities ordered by how many laptops can share a particular activity at any one time.

The overall student impression is interesting - they still see them as fun machines, not as work devices - and this is a good thing in that they are working and learning without even realising it. Our XO experts have also been taking on further responsibility now by training students from other classes so the benefits of the laptops can extend across the school.

We are at the stage now where its possible to begin planning a full personalised learning phase - where the XO's enable students to begin taking full responsibility for their learning simply because they have access to so much information and resources. This will hopefully be our phase 5 - the 'iLearn' project.

DISCUSSION CHALLENGE:

The 'Miracle Transformation Fallacy'

"This is the notion that, if we could get little green laptops into children's hands, it would miraculously transform their lives. This fallacy falls within an approach known as "media determinism," the notion that a particular media or technology will automatically have a certain effect no matter what context it is deployed in.

However, a long history of experience with all media indicates that they are heavily influenced by the context of their use. One good example of this is the TV show, Sesame Street, which was designed to foster greater social and educational equity in the U.S. by bringing quality educational programming into the lives of young children who lacked other educational resources.

However, subsequent research showed that rich kids benefited much more from Sesame Street than poor kids, in part because they had the parents and other family members who sat and watched with them and discussed the show in ways that maximized what children got out of it." This example shows that good guidance and scaffolding (ie. by class teachers) will always be needed.

"I do not think these benefits will come about simply by placing laptops in childrens' hands.
Rather, laptop programs need to be part of complex educational reform efforts, involving teacher training, curriculum development, pedagogical support, etc."

- Mark Warschauer, June 2, 2009 http://www.olpcnews.com/commentary/academia/the_miracle_transformation_fal.html

Helpers Sheet

Do's:

1. After you turn the computer on, always make sure there is enough charge in the battery before using - (see the battery icon on the Home View).
2. Whenever possible, dim the screen to save power.
3. Always turn off the computer if it is not going to be used for a long period of time.
4. After use, always close and lock the antennae before putting the laptop away.
5. Protect the computer from dust and water as much as possible.
6. Be gentle with your computer!!
7. If the computer freezes or stops working while you are using it, turn off using the power button.

Don'ts:

1. Never pull at the antennae ears (especially when opening the computer) of carry the computer by holding onto the antennae ears.
2. Do not scratch the keyboard or touchpad.
3. Do not press any keys when the computer is booting up (i.e., is in the process of turning on)
4. Do not take the battery out while the computer is running.
5. Do not press the keys on the keyboard with anything other than your fingers.
6. Do not put stuff inside the different opening you see on the computer (e.g., USP ports, power jack, microphone/headphone jack etc.).
7. Avoid touching the screen. Do not touch the screen with any sharp object.

Mini-lesson guides A and B for printing:

XO Mini-lesson A: Learn the BASICS.

1. Go through the helpers sheet
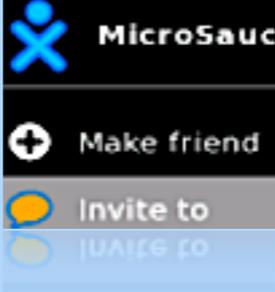
2. Learn the trackpad- play the fish game

XO Mini-lesson B: Learn KEYBOARD.

1. Explain the parts of the keyboard:

2. Start WRITE and name it.
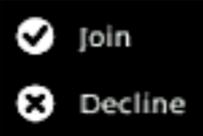
3. Type a sentence about 'the green machine'.

Mini-lesson guides C and D for printing:

XO Mini-lesson C:

SHARING:
1. Open **Write**. Change 'Share with' to 'My Neighborhood'
2. Go-> Neighborhood view
3. Hover over a friend & click '**invite to**'

MicroSauc
+ Make friend
Invite to

JOINING:
1. Open the **Frame**
2. Hover over the new activity & click '**join**'
3. *OR* join by clicking the activity at the neighborhood.

✓ Join
✗ Decline

XO Mini-lesson D:
Learn RECORDING.

1. Start RECORD
2. Name the activity
3. Select **photo** - click ⊙ to take a photo
4. Set timer to 5 seconds, swivel screen.
5. Push ⊙ *button*, aim camera & wait for sound.
6. Repeat for **Video**/ **Audio**

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How to show the XO to kids:

by Eliza and Shayla 4F

1. OPEN IT UP - gently twist ears around, then lift from top.

2. Show what different parts are:

- keyboard, trackpad, left and right click buttons, camera, microphone, speakers, USB slots, screen-swivel.

3. Talk about SAFETY:

- always hold by the handle.
- don't pull on the ears.
- don't undo the battery locks.
- be gentle if turning the screen.

4. On Button - does 3 things:

- turns it on.
- push to put to sleep/ wake up.
- hold for 10 seconds to turn off.

5. Four view buttons -

1. Neighbourhood.
2. Friends.
3. Activities.
4. Last activity or Journal.

6. The FRAME lets you switch between activities OR get to the Journal.

7. The Journal saves all your work so you can find any of your activities.

Sample lesson outline for phase 4:
Introduction to Writing Poetry.

Focus: The capabilities of XO-type devices means that introducing poetry (or any writing genre) to students can become a much more interactive and connected activity, thus offering constructivist and collaborative opportunities for student learning that are not otherwise possible.

By the end of this lesson students will be able to:
> discuss a sample poem to identify its parts, > record the poem in their own voice, > capture an image associated with the the poem, > use these as stimulus to begin to add their own lines on to an existing poem

Tools:
• Short Poem selected for interest to students and their school environment (so a relevant photo can be taken)

• XO Laptops - 'Record' & 'Joke Machine' activities. (Could also be adapted to use 'Story Builder if its available')

Steps:
• Teacher finds a short poem (4 or so lines), make paper copies or share with students via XO neighbourhood
• Students discuss - What makes it a poem? What are the parts of poem? What is it describing? Does the title match the subject? How does the poem sound out loud?
• Students open 'Record' and use the audio tab to record themselves reading the poem.
• They then use 'image' in 'Record' to capture an image that matches what they decided the poem was describing.
• Students open 'Joke Machine' which will be utilised as a poetry machine instead for this task.
• Students start a new jokebook, titling it 'Poetry Book'.
• From the book cover screen, they add their poem recording and image (these can be changed for succeeding poetry tasks).
• Students then 'add a joke' (poem in our case) and can add the image again to this specific page.
• On this page they type the original poem into the 'question' box.
• They then add their own line (respecting any rhyming etc in the original) in the 'answer' box
• From here, they can preview the page, or even share their jokebook and discuss with other students.

Sample lesson outline for phase 4:
Chance and Data

Focus: The capabilities of XO-type devices means that normal class activities like learning about chance and collecting data can become interactive, with results recorded digitally and available for later use, as well as sharing and further collaboration. The Slider Puzzle activity has a built in shuffle activity for producing random results perfect for collecting, discussing and charting data.

By the end of this lesson students will be able to:
> begin to understand what chance and random mean in the mathematical sense > generate random data using the XO > record random data for later sharing and graphing

Tools:
- XO Laptops - 'Slider Puzzle' & 'Write' activities.

Steps:
- Students are organised in pairs with one as A, the other as B. (They can be physically next to each other, or just use the XO sharing to view each others Slider Puzzle screens, then switch back to Write using the Frame to record the data).
- Aim is - to record how many letter A's appear on the top line? (Many other variations also with numbers are also available).
- Teacher and students should discuss what 'chance' and 'random' mean, and make and explain predictions for the task.
- Person A loads Slider Puzzle, selects 1234 puzzle option, then clicks on shuffle.
- Person B record in Write an 'A' if a letter A appeared on the top line, or a zero if none.
- After twenty shuffles by person A, stop and discuss how the results compare to predictions? Do students want to change predictions for next round? If so why?
- Person B now loads Slider Puzzle and shuffles letters in the same way twenty times.
- Person A does the recording in Write.
- Final results from the two rounds can be further discussed, shared with another pair, averaged, graphed etc.