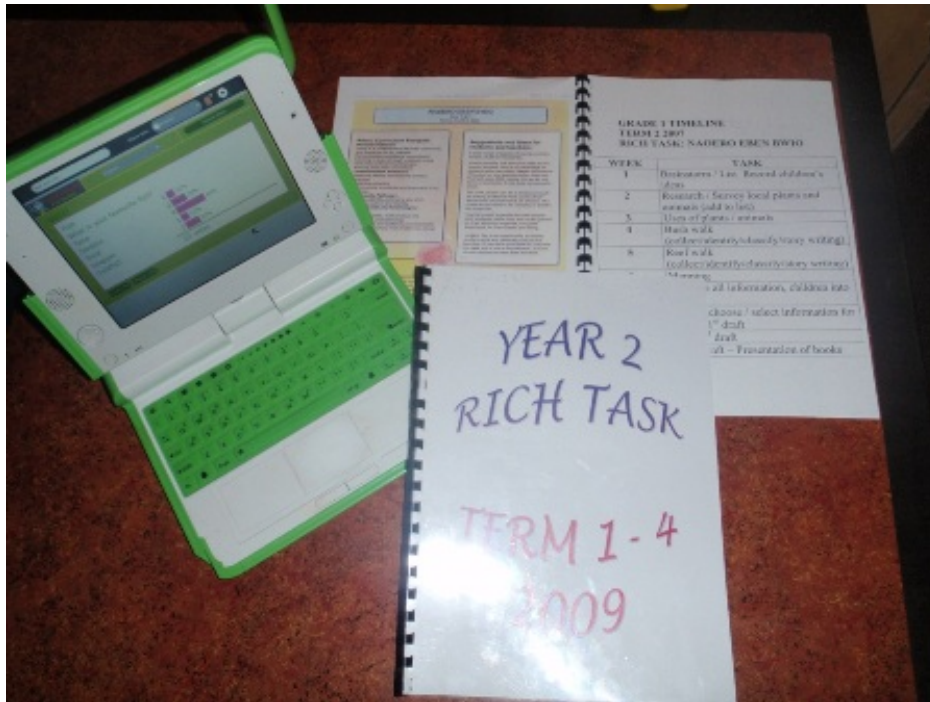# Leeming International Consulting

Technical Assistance to Nauru Ministry of Education
One Laptop Per Child Programme

April 24-May 11 2009

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OLPC and Nauru Year 2 Rich Task *An Kiwiwud Bwio Naoero* (Changing Nauru … How Nauru is changing)

Contents

Recommendations

The following recommendations are based on the assumption that Nauru desires a Country Programme leading to one laptop for every child in the primary education system, as has been indicated by the Minister of Education, Honourable Roland Kun, MP, in his letter of request to the OLPC Oceania Technical Working Group, dated 25th March 2009.

Request Country Programme support from OLPC partners

1. That an open letter of request is signed by the Minister of Education, and sent to OLPC Oceania's Regional Director. (Completed)
2. That the letter is followed up immediately with details of proposed country strategy (with this report providing guidance) and numbers of XOs needed (from the calculation below).

Deployment: Year 1-3

1. That a stock take is conducted of all the 200 XO laptops delivered.
2. That the numbers needed to complete (saturate) Year 1-3 by beginning 2010 are assessed as follows:
    a. Number needed to complete all Year 2 including teachers = A
    b. Numbers needed to complete this year's Year 1 and all teachers = B
    c. Estimate of next year's Year 1 intake = C
    d. Number of teachers in next year's Year 3 = D
    e. A small pool of spares and laptops for a community OLPC club. 50 would be sufficient.
    f. The above A+B+C+D+50 (approximately 650) provides an estimate of the numbers needed for saturation of Year 1-2 this year and Year 1-3 at the beginning of next year.
3. That a request for the number of XOs identified above is made to OLPC Oceania immediately, due to long lead times (90+ days) and OLPC Oceania's need to combine small orders less than the minimum order (1,000).
4. That specific mention is made in the request for XOs "with the latest touchpad type, resistant to the "jumping cursor" problem";
5. That charging racks and XOP power cables are ordered with the laptops, from OLPC partner company Belkin. The number of 24-rack/XOP sets required will be the number of laptops divided by 24, rounded up.
6. That 50 spare rubber keyboards are also ordered from OLPC Oceania to repair the ones damaged to date, and that training is given to students to avoid peeling the keys off the rubber keyboard cover.
7. That an alternative funding strategy is considered should it be the case OLPC Oceania is not successful in arranging external donor funding.

Deployment: Year 4-6

8. That the number of students and teachers in next year's Year 4-6 is estimated (approximately 800) and a decision is made whether to include these years in the deployment now or as a second phase in 2010. OLPC Oceania to be informed of the decision. Charging racks and XOP cables are also required.

Maintenance Plan

9. That a database is started and maintained by Nauru ICT with a record of each XO, with serial number, owner and history including faults and repairs. This database can also function as the user authentication system allowing control over access to the school server and Internet (see infrastructure plan).
10. That the annual number of XOs needed is estimated and included in the annual budget estimation. This will include laptops for incoming Year 1, for new teachers and for replacements of failed units. At this time, the failure rate would be estimated at about 1% of the number of XOs in-country. With time and experience this number can be revised.

11. That a budget is made available for local repairs. For instance about 5% have locally repairable faults or damages, predominantly rubber keys peeled off the keyboards - a type of damage easily avoided by teaching the children to be careful.
12. That a Community OLPC Club is started and a small pool of above 10-20 laptops is provided (as recommended above), which can be used by ICT enthusiasts, older students and school leavers for technical training and research. USP Centre might be an excellent partner to host this club, and they should be approached. NSS might also be involved. The club can then support the programme repairing laptops, developing new lesson ideas, investigating (and even creating) new activities and content, updating and translating the laptop to Nauruan. The Club should be represented on NOSC.

Student Training Plan

13. That students are trained by the teachers in the basic operation of the laptop (as detailed in this report). The training should preferably be conducted before the teachers start to integrate OLPC into their lessons. Initially this will take up about 1 hour per week for about 4 weeks, and ideally should take place on a Wednesday so that teachers can reflect on the training in their Thursday self-help session.
14. That teachers arrange a regular XO training session with students, weekly if possible, or about 1 hour duration. This will be used for general trying out of activities, a chance for students to show (and even teach) the teachers what they know, and the teachers can try our their ideas.
15. That parents and the Community OLPC Club are encouraged to also help training, especially with new students. The NOSC can provide the linkage with community.

Teacher Continuing Training Plan

16. That teachers in both Yaren and Kayser should continue their self-help sessions each Thursday. To provide some focus and sustainability, a simple plan with objectives should be outlined, and copied to Nauru Education so that they can monitor progress. More detail is provided in the report.
17. That all teachers should sign up to the Nauru OLPC Google Group (email list) so as to obtain support from an expanded community of practice.
18. That teachers focus on the following self-learning programme:
    a. Completing all the basic training, and becoming confident in all areas of the students' training curriculum.
    b. Practice and become familiar with a suggested subset of standard activities that can easily be integrated into lessons. Details are given in the report.
    c. Teachers with "OLPC classes" should complete the student's basic training before starting to introduce the XO into their lesson planning.
    d. Once [c] is completed, teachers can start to try simple activities to support lesson objectives. Guidance is given in the report including the "toolkit" attached.
    e. Teachers should discuss and reflect on class management techniques and experiences with using the XOP in lessons. Some guidance is given in the report.
    f. Teachers should all start to regularly use email, monitor and contribute to the NOSC email Google Group and thereby become active members of a "community of practice".
    g. Teachers should regularly practice accessing material on the server, searching for useful content on the Wikipedia and Wikieducator and downloading as PDF using the office laptop or PC.
19. That teachers should keep a record of lessons learned and training needs identified. These can be tabled at the NOSC and any recommendations made to Nauru Education.
20. That specialist teachers should be assigned (by agreement of NOSC) to support more technical tasks required by other teachers such as downloading content for the server, creating, converting and editing audio content using the Audacity software, creating wiki pages (such as lesson plans) on the Wikieducator, etc.
21. That Nauru Education should consider arranging additional training for the Year 1 – Year 3 teachers
    a. Wikieducator training
    b. Additional training on curriculum integration and content development

    c. General skills for collaboration, innovation, OERs, etc
22. That Nauru Education should remain in touch with OLPC for news regarding regional support for OLPC programmes, including volunteers, exchanges, workshops, etc.

Curriculum Integration Plan

23. That teachers should be aware of different modes in which the XO helps with a child's learning, all of which merit allocation of classroom time and "home work". These include:
    a. Using the XO directly in support of curricular learning objectives;
    b. To facilitate self learning and research, which may or may not be directly connected with the curriculum but widens and enriches the learning environment, and helps the child "learn learning";
    c. For learning ICT skills and information literacy, with regard to electronic offline and online resources and modes of communication;
24. That in regard to using the XO directly to support curriculum tasks, the teachers should consider the following questions/areas. A "toolkit" is provided in this report, with more guidance.
    a. Which attribute(s) of the ICT are you (the teacher) hoping to apply with the XOs?
    b. Which desired teaching methods will the XO activities enable?
    c. What are your classroom management methods for the use of the XO?
    d. What added value does the XO provide?
    e. What are the risks, including the added burden on the teacher's workload, and how will they be managed?
25. That teachers start with simple activities and evaluate how well these work before trying more ambitious activities with the XOs. A list of some "standard" tools and activities that can work well in many lessons is given in this report.
26. That teachers should employ proper methodology in lesson planning for the XO, including clear objectives, identification of skills learned / knowledge to be gained, evaluation, grading and future recommendations. A template / example of suggested framework is included in this report;
27. That the evaluations of trial lessons using the XO in the classroom should be the subject of regular meetings, NOSC, the self-help groups, etc.
28. That best practice and proven lessons using the XO should be documented for future reference;
29. That through the approaches described above, a list of recommended activities using the OLPC can be built up, associated with each week of the Rich Tasks. This can then be approved by NOSC and recommended to the Nauru Education (CASE Unit?) for official inclusion in the next reprint of the curriculum;
30. The content development is also associated with curriculum integration;

Content Development Plan

31. That teachers use the skills from their training to continue to search for online resources related to the rich tasks, on sites such as the Wikieducator, Wikipedia and Curriki. Resources should be downloaded and saved to the server;
32. That Nauru Education / NOSC liaise closely with OLPC Oceania and SPC to obtain additional educational resources related to the curriculum. For instance, many regional programmes of SPC and other regional organizations can provide content related to conservation, health, livelihoods, sustainable development, fisheries, reef and marine biodiversity, etc. Community groups might also help to drive this forwards, for instance David Dowiyogo has expressed interest in the potential for Public Health awareness using the laptops;
33. That teachers should be encouraged to save students' work and archive it on the server when appropriate;
34. That teachers, students and the community via the Community OLPC Club should also be encouraged to create supporting resources in various formats including PDF, audio, photographs/images and editable lesson resources for Write activity such as worksheets. Teachers should be aware of the Classroom Presenter activity, which will be very useful when it matures and it is possible to create slide presentations for the XOs.
35. That a framework of folders is created on the server with categories for each year and each week of the Rich Tasks, to accommodate this process. (Note that a Moodle learning management system is integrated in the

school server, and can be used for content management. This will require training and further technical advice. Future versions of the XS school server will have improved Moodle customizations and features.)

36. That a list of recommended resources can be built up and reviewed by NOSC for official recommendation to Nauru Education to be included in the curriculum.

Infrastructure Plan (collaboration between Nauru Education and ICT)

37. That servers should be installed in each double classroom / one server for two classrooms. SPC has identified suitable low power, low cost server technology (approx AUD 500 per server plus cost of Access Pointss). Servers can be cascaded in master/slave configuration. Additional Technical Advice may be required for this. To cater for saturation in Yaren P.S., six servers will be needed, and two in Kayser College;

38. That means of file transfer and content management using Putty and WinSCS be installed for all servers allowing teachers easy drag and drop means of adding content to the server;

39. That MAC authentication is built into the school server wireless connection, with each XO authenticating against a database of MAC addresses, or otherwise as recommended by ICT (see below);

40. That filtering is enforced, such that all adult and undesirable content (as defined by Nauru ICT/Education) can be filtered at the gateway. Temporary solutions using OpenDNS, SquidGuard etc, have proved unsatisfactorily. The system employed must filter search engine results or force strict safe search policies including image searches. One possibility is to route all traffic through ICT's Content Keeper Appliance using VPNs. This will also provide means of authentication. As a temporary solution, Eroni might install "Dansguardian" on Yaren's server (it is recommended that experimentation is done on a separate machine until the installation process and results are known).

41. That 2GB minimum flash drives are provided to each teacher. This are needed to transfer contents and save work;

42. That a mobile hard drive backup is provided to back up the school server and important resources on the schools office computers;

43. That the schools' laptops and office computers are enabled for wireless and wired access via the school server connection, installed with PDF writers and other useful software such as Op[en Office 2.3+ (which supports Wikimedia export) and Audacity (open source audio production software – install software is provided by the consultant, or Google and download);

44. That Internet access is provided at Kayser College for a school server;

45. That ICT develops a server development capacity, possibly in association or "out sourcing" to the Community OLPC Club. Additional TA and training may be required, and the regional OLPC "community" (and OLPC Oceania TWG) is available to assist.

Community and Parents Involvement

46. That all parents of children in Years 1-6 are briefed on the OLPC. The NOSC can continue with this programme following the consultant's briefing sessions, and using the supporting PowerPoint slideshow. In particular the safety risks and supervisory requirements should be explained to parents.

47. That all parents should be asked to sign the "parents agreement with community deployment guidelines" when their child receives an XO. These must be copied and filed for reasons of accountability and to ensure all parents have been briefed;

48. That a Community OLPC Club is started, possibly hosted by a potential NGO partner (USP Centre would be ideal). See Maintenance Plan for more details.

49. That regular training sessions with parents and students are provided. This might be increasingly handed over from the NOSC to the Community OLPC Club.

50. That community projects including those not directly associated with schools or Nauru Education should be encouraged to link to the OLPC Programme. For instance:
    a. The projects might be able to develop suitable educational contents;
    b. Children might be involved, collecting data, etc (with appropriate parental supervision);

    c. Projects might be regional (SPC, etc), or local (Church, Women's groups etc). Regional projects that are recommended include SOPAC's GIS data collection, climate change (recording weather data), conservation (sustainable fishery and reef management), etc

Evaluation Plan

51. That teachers continually monitor and reflect on experience and keep Nauru Education informed;
52. That the NOSC and Nauru Education draw up an evaluation framework with objectives, indicators and instruments. SPC / OLPC TWG can give advice and help draw up this framework;

Cyber Safety and Child protection

53. That Nauru Education make a request to SPC to provide advice on recommended child protection and cyber safety programmes suitable for the OLPC programme;

Recycling

54. That Nauru Education make a request to SPC to provide advice on a recycling programme;
55. That all failed and worn-out XOs should be stored safely in the meantime, as they can be "cannibalized" for parts;
56. That records be kept of all failures and inventory of parts etc;
57. That in particular, toxic components such as batteries should be stored and recycled safely;

Governance Plan

58. That NOSC works with and represents all communities on Nauru;
59. That the NOSC reviews their objectives following this technical assistance, and revises and updates them;
60. That the NOSC, Nauru Education and Nauru ICT decide on the reporting and accountability of the proposed Community OLPC Club;
61. That Nauru Education corresponds with OLPC Oceania Technical Working Group and SPC, and is kept informed of the regional programme.

Funding Plan

62. That Nauru Education requests assistance with their Country Programme from the OLPC Oceania Technical Working Group (a letter of request has been sent, on May 6th 2009). This might provide funding for the Deployment Plan.
63. That Nauru Education considers options for alternative funding for the Deployment Plan should the above prove unsuccessful;
64. That Nauru Education assess the cost of a sustainable ongoing programme (with reference to the Deployment, Maintenance, Training and Infrastructure Plans) and submit these estimates to budgetary and planning processes as appropriate;

Report

This reports on a 14-day mission to Nauru, between April 24th and May 12th, 2009. The terms of reference were to:

1. Work with classroom teachers at Yaren School in the three years levels – Years 1, 2, 3 with the aim of providing them with skills to best utilize the learning potential of the XO machines
2. Work with School OLPC coordinator, Ms Salodina Thoma, to provide her with training to enable her to sustain the skills you provide to teachers.
3. Provide advice to Education Department on technical aspects of the OLPC program
4. Provide advice to Education Department on ways to sustain the program.

The mission followed two earlier related TA inputs by the consultant into Nauru's OLPC trials program in 2008. These missions were under auspices of the SPC's regional trials programme. Reference can be made to the reports. The current mission was arranged by Nauru Education directly with Leeming International Consulting, a company incorporated in Solomon Islands.

General Comments and Observations

The OLPC programme on Nauru appears to be building sustainable momentum. Teachers are very positive and enthusiastic, and willing to put considerable time and effort to learn more. The response from the community is excellent. Teachers have now been trained beyond simply using the laptop to the stage of innovation, where they are formulating ways to integrate the OLPC into their teaching to support the rich task curriculum. However, only a few teachers have reached this stage, and they do need to continue with their self-help programme and to learn from each other. All teachers have made excellent progress in mastering the basic operation of the laptop, including networking, accessing the server and Internet, most activities on the laptop, creating resources, using USB drives, and searching for open educational resources on the Wikieducator and other sources.

A few teachers managed to try out planned lesson activities using the laptop to support curricular learning objectives. The "core team" might be listed as the below, although others were involved and all must be congratulated for their efforts and achievements.

- Lavina Akken
- Nona Thoma
- Mary Tebouwa
- Salodina Thoma

Training was also given at Kayser School, and their Year 2 teachers attended. However, more attention will be needed at Kayser when additional XOs are deployed, as the focus has been on Yaren. Kayser also needs a school server to allow their teachers to practice with it.

The R.O.N. is showing leading political will and the Minister has signed and sent an open letter requesting assistance with a Country Programme, to the OLPC Oceania Technical Working Group, which includes SPC, ACER, ITU and others.

Nauru must now decide how it wishes to proceed. The recommendations in this report assume that saturation of Year 1 and 2 are required as soon as possible in 2009 and the incoming Year 1 next year, which will saturate years 1-2 by January 2010.

Leeming International Consulting is very willing to contribute further to Nauru's programme, working in collaboration with the regional programme as appropriate.

Resources

All the PowerPoint slideshows and a variety of resources including software and Wikieducator training materials has been left with Yaren school, on the office computer (computer room). This includes papers on OLPC from different countries, literature reviews of OLPC, and slideshows used to brief the HODs and community/parents.

The OLPC Nauru wiki page http://wiki.laptop.org/go/OLPC_Nauru will be updated with a briefer, public version of this report, by the consultant. The NOSC can also learn to manage and update this page.

Outputs: Tasks and Activities Completed

Agenda

A schedule of activities completed is shown in Annex 1.

Teacher training

Training sessions were held in the afternoons on working days plus extended training on Saturday and Sunday of the final weekend. Teachers attended from Yaren and one or two from Kayser. The group varied from day to day but was never less than about 10-12 teachers.

Training included the following components below. Follow up action by teachers is described in the section "Advice Given". Recommendations are listed at the beginning of the report.

1. Basic operation of the laptop, accessing server and Internet
A basic laptop training curriculum is given in Annex 2. This is generally the same for teachers as students. The teachers who attended training can now be considered to have completed all the curriculum apart from the more complex activities, although these were demonstrated to them, so that they are aware of the potential.

2. Training students
Through the classroom sessions, it was demonstrated to teachers what is required in terms of initial training.

3. Collaboration by email and Wikieducator
Teachers signed up to webmail to allow collaboration with an expanded community of practice. A Google Group was set up for this purpose: http://groups.google.com/group/nauru-olpc (nauru-olpc@googlegroups.com). Moderators are Lavina, Salodina and David. Not all teachers have yet managed to create accounts due to connectivity problems. Lavina Akken has shown interest in wiki training and was shown how to sign up for a Wikieducator account and access the online tutorials.

4. Curriculum integration including classroom training
Training was given in the modes in which the XO helps with a child's learning, all of which merit allocation of classroom time and "home work". These include:
- Using the XO directly in support of curricular learning objectives;
- To facilitate self learning and research, which may or may not be directly connected with the curriculum but widens and enriches the learning environment, and helps the child "learn learning";
- For learning ICT skills and information literacy, with regard to electronic offline and online resources and modes of communication;

When considering integration of the XOs and OLPC resources into lesson planning directly associated with curriculum objectives, the teachers were asked to consider the following:
- To identify the attribute(s) of the ICT that will be leveraged;

- To identify the desired teaching methods that the XO activities enable;
- Classroom management methods for the laptop activities;
- To identify the added value that the XO provides;
- To do a risk assessment and identify the risks, including the added burden on the teacher's workload, and how they can be managed.

It was recommended that teachers start with simple activities and evaluate how well these work before trying more ambitious activities with the XOs. A list of some "standard" tools and activities that can work well in many lessons is given in the annex. For instance, teachers practiced using the Poll activity, which can be used by students to do community surveys associated with much of the rich task. This was actually tested in class (see below).

In group sessions throughout the training, teachers worked on some simple lesson plans. Although time did not permit extensive testing, a few of the "core group" of teachers (Mary, Lavina, Nona, Salodina with help from others) did manage to test out some planned lessons with XO integration, directly following the rich task for that week. These example lesson frameworks are given in the annex. The test lessons included the below (also see annex for more details on these):

- Using Measure, TamTam and Write activity to investigate sounds in the environment, and classify and document them. (Rich Task An Kiwiwud Bwio Naoero, Week 11, Environmental Area, Energy and Force, Compare, identify, clarify between sounds)
- Creating a poll about where the family buys fish, and then comparing photographs of different types of fish using photographs on the server. (Rich Task An Kiwiwud Bwio Naoero, Week 11, Environmental Area, Identify… and name services in the community)
- Using Memorize Game to match value of different groups of coins. This is also part of Rich Task An Kiwiwud Bwio Naoero, Week 11, Environmental Area, Recognize and name coins)

Teachers also searched for open educational materials to support each week of the rich task. For instance, useful articles "Nuclear Family" and "The Family" were downloaded from Wikieducator and Wikipedia in PDF format and place3d on the server, to support Week 1 (Identify and Illustrate Nuclear and Extended Family). Articles on Hygiene and Food Poisoning were downloaded to support Week 5 (Personal Hygiene – investigate traditional and modern methods).

Teachers should employ proper methodology in lesson planning for the XO, including clear objectives, identification of skills learned / knowledge to be gained, evaluation, grading and future recommendations. A template / example of suggested framework was developed with the teachers and is included in the annex.

See recommendations for follow up actions.

5. Content management and development training
Teacher were trained how to access, create and save simple content on the server:

- Write documents, which can be transferred on flash drives to the server as editable resources or converted on the school's Windows computers to PDF and saved on the server as read-only resources;
- Polls and Memorize games for future use (once this is understood the same principle can be applied for many more XO activities);
- Images (photos and paintings) from the XOs or digital cameras to be saved on the server and accessed in Browse activity (Lavina and Salodina were trained to use Microsoft Picture Manager to resize digital camera images to lower resolution);
- Audio content (recordings) from Record activity;
- Audio content created, edited and converted (to/from mp3 and ogg) using Audacity software installed on the school PC;
- Accessing the Wikieducator and Wikipedia and downloading content to support the Rich Task lesson objectives. Teachers were shown how to "download as PDF" onto their laptops and transfer files to the server via flash

drives. A framework of folders corresponding to the Years and Weeks of the Curriculum has been started and already some relevant contents downloaded;

- Lavina and Salodina were shown how to access OLPC content collections from the OLPC Wiki website and install on the XO laptop.
- Eroni Tuiloma provided a very useful collection of eBooks on all kinds of subjects related to the children's learning and of great interest to the community, from a set of commercially produced CDs/DVDs. This has been loaded on the server. However, there will be copyright issues and it s recommended that this practice is not adopted widely without contacting the authors and requesting limited use of the materials on XOs via the school server.

It is highly recommended that innovative teachers are empowered to develop content online on the Wikieducator. If the practice of sharing lesson plans on the Wikieducator as open educational resources is encouraged regionally, it could lead to sustainable and large-scale content creation and a significant pool of relevant and adaptable resources. Thus, additional Wikieducator training is recommended. During the training is was demonstrated how a lesson plan idea using OLPC could be posted on the Wikieducator.

Additional advice on continuing training is given in the "Toolkit" in the annex and the recommendations.

Feedback from test lessons

Although limited time was spend on trial lessons, the following observations were made:
- The lesson on comparing sounds worked very well. Students were able to capture sounds using Measure, create tables more quickly than drawing them by hand, and insert the captured waveforms.
- The lesson with Polls also went well but we forgot to tell them to save the polls before they went home. Lavina will try this out again.
- Initially the task of helping students to do basic operations is time consuming, but one can expect this to be easier and quicker with time once the students know basic things such as checking connection, neighbourhood view, the server, keep/save and locating saved files, etc
- Class management is needed. For instance, students can be given some set work to do (not using laptops, or simple things such as games) whilst the teacher helps a smaller group of students at a time. More advice is given in the "Toolkit"
- Sharing resources with students is much more efficient and reliable if the resources are put on the server. For instance, photographs of fish were shared from the teacher's laptop but they were unavailable on the student's laptops, because Browse shares a link and not the file itself. When tested using the server the photographs share reliably and quickly.
- Initially the task of integrating the laptops is very time consuming and places extra burden on the teacher. But with time it will become easier and when students can be managed efficiently, when they can quickly follow instructions, lessons can be planned to free up time for the teacher to help and facilitate individual students.

Student Training

During a few class sessions, it was demonstrated to teachers how students can be trained in the basic operations of the laptop and activities. It is clear that this must be completed, and all students acquire reasonable confidence in using the laptop before the XOs can be used in specific lesson activities connected to the curriculum. Additional advice is given in the recommendations.

Additional advice on Student training is given in the "Toolkit" in the annex.

Community and Parents' Briefing and Training

Very strong interest from parents and community groups led to repeated sessions involving over 100 parents (estimated), where the consultant presented the PowerPoint slideshow "Parents Briefing" (available from Yaren School's office computer). The briefing included:

- Background to OLPC and regional OLPC trials programme, and Nauru's trials;
- Educational theory of the OLPC;
- 5 core principles of OLPC;
- Activities and server content (with demonstrations);
- OLPC in teaching and curriculum;
- OLPC in the community;
- Community OLPC Club;
- The Parent's Agreement;
- The Community Deployment Guidelines;
- Child and cyber safety;
- Re-cycling;
- NOSC;

The demand was such that daily training was given to parents. The training consisted of basic operation and laptop activities. This is highly recommended as it really helps them to work with and support their child's learning as well as appreciating the benefits and valuing the programme.

Advice Given

Additional advice was given as part of this technical assistance. This consisted of:

- A teacher's "toolkit" to aid lesson planning and curriculum integration. This is a work in progress. It is given in the annex.
- One sample 4-laptop charging rack module was left at Yaren. Advice is given to procure these and XOP power cables. Details in the annex.
- A sample school server system was demonstrated to the Director of Education and the teachers. This has been identified as a scalable, robust solution, also being low cost and low power, as identified by SPC. It is recommended that 6 servers are installed at Yaren and two at Kayser. These will need to be implemented with further technical advice. The SPC recommended solution allows easy scaling up of the server infrastructure. See annex for more details.
- The consultant worked closely with Eroni Tuiloma of ICT Dept ICT and kept the Director Marcus Tanner informed, in the following work on the server at Yaren (with many thanks to both of them). See recommendations for follow up action required.
  - Upgrade to 0.5.2
  - Installation of OpenDNS temporary filter solution
  - Internet connection
  - Squid proxy service
  - Eroni installed a system using Putty and WinSCS that allows easy management of the server remotely, using a Windows computer. Teachers can now easily add and manage content.
- This report with recommendations constitutes advice for NOSC and Nauru Education on the action needed to implement a country programme.
- Community and Parents (briefings).

Annex 1: Agenda Followed during the mission

	Morning	Afternoon
Monday 27th April	8am – 12pm : Technical training (support team) • Internet access • Linux training • Server 0.5 set up • Adding content to server • Updating XOs and installing Flash • Adding activities and collections • Internet filtering and authentication	2pm – 3pm : Parents Briefing, Group 1 3pm – 5pm : Teachers-in-service • New activities and managing/preparing audio with Audacity • Participatory planning, agree on strategy and schedule • Agree group work
Tuesday 28th April	8am – 12pm : Technical training (support team) • Continue as above • Audacity • Open Office with XO files and PDFs • Wikieducator for Lesson Plans	2pm – 3pm : Parents Briefing, Group 2 3pm – 5pm : Teachers-in-service • Start group work • Ad-hoc technical training on laptop activities • Integrate basic training for those who need it
Wednesday 29th April	8am – 12pm : Technical training (support team) • Continue as above • Complete technical training	2pm – 3pm : Parents Briefing, Group 3 3pm – 5pm : Teachers-in-service • Continue with training programme
Thursday 30th April	9am – 10am : Class room session Y2 class 1,2 • Ad-hoc training on using laptop/server 11am – 12am: Parents training Group 1	2pm – 4pm : Teachers-in-service • Continue with training programme
Friday 1st May	9am – 10am : Class room session Y2 class 3,4 • Ad-hoc training on using laptop/server 11am – 12am: Parents training Group 2	2pm – 4pm : Teachers-in-service • Continue with training programme • Compare and discuss lesson plans • Feedback and review of training so far
Saturday 2nd May	As required	As required
Sunday 3rd May	Reporting and documentation time	Reporting and documentation time
Monday 4th May	9am – 10am : Class room session Y2 class 5,6 • Ad-hoc training on using laptop/server 11am – 12am: Parents training Group 3	2pm – 4pm : Teachers-in-service • Continue with training programme 5pm – 6pm: Parents training Group 3

Tuesday 5th May	Technical work on server and ad-hoc training of support team	2pm – 4pm : Teachers-in-service • Continue with training programme 5pm – 6pm: Parents training (open)
Wednesday 6th May	10am – 12am : Class room session Y2 students • Teachers give prepared lesson	2pm – 3pm : Teachers-in-service • Feedback on prepared lessons, discussion • Continue with training programme 3pm – 4pm: Briefing for Heads of Department, Cabinet Room 5pm – 6pm: Parents training (open)
Thursday 7th May	10am – 12am : Class room session Kayser College • Ad-hoc training on using laptop	2pm – 4pm : Teachers-in-service • Feedback on prepared lessons, discussion • Continue with training programme 5pm – 6pm: Parents training (open)
Friday 8th May	10am – 12am : Class room session Kayser College • Ad-hoc training on using laptop Complete any technical training	2pm – 4pm : Teachers-in-service • Feedback on prepared lessons, discussion • Continue with training programme
Saturday 9th May	10pm – 4pm : Teachers-in-service • Continue with training programme	
Sunday 10th May	Reporting and documentation time	1pm – 4pm : Teachers-in-service • Continue with training programme • Recommendations
Monday 11th May	10am – 12am : Class room session Y2 students • Teachers give prepared lessons	4pm-6pm Parents/Community briefing, Kayser College
Tuesday 12th May	10am – 12am : Class room session Y2 students • Teachers give prepared lessons	

Annex 2: Laptop training curriculum

Both students and teachers need to complete training in the basic laptop operation. The general curriculum content is shown below. There is no general rule relating ages to specific activities and laptop skills. Each student will learn to use the laptop at their own speed. However, generally speaking the younger ages will be slower to learn the more complex activities. The following list is illustrative – not comprehensive. For instance, "Paint" can be both easy and complex depending on how it is used, but it is placed in "Easy" category because it is easy to start using it. Note that there are many more activities available. Note that TurtleArt is an excellent entry-level programming activity, and students can go on to explore programming with Pippy, Scratch and EToys.

Basic	Networking and resources	Activities to introduce	
• Orientation • Opening, closing, "ears" • eBook format • Starting / shut down • The 4 Views • The Frame • Screen rotate • Volume and Brightness • Functions • Sharing • Inviting • Intro to the Journal • Trouble shooting. Restarting if in difficulty • Hard (forced) reboots • Going in/out of sleep mode • Charging and battery monitoring • Help activity • The Control Panel • How to reinstall the laptop operating system and activities with a prepared flash drive	• Finding and connecting to access points • Checking connection status via Frame view • Connecting to school server • Starting and coordinating a shared activity • Joining a shared activity • Inviting someone • Copying files to/from Journal with flash drive • Awareness of memory, checking memory usage • Renaming and deleting files in journal • Using Public Internet • Accessing the OLPC wiki laptop activities and collections pages from Browse	**Easy** • Record - take photos • Speak • Paint • Measure • Chat • Memorize – built in games	• Stopwatch, Ruler • Clockgame • TamTamMini • Write - simple writing • Calculate • Poll • Other simple games
		Moderate • TurtleArt • TamTamJam • Memorize - create games • Browse - access server - search with Google • Moon / Star chart - setting time/location etc	• Word - tables, formatting - inserting photos • Record - record and replay sounds and audio • Calculate - using variables
		More complex • TamTamEdit and SythLab • Pippy • Scratch • E-toys These are a bit harder, and teachers may need some training. But older students are capable of figuring them out themselves. TamTamEdit allows the student to program music and record it.	Scratch is the easiest – uses blocks like TurtleArt. Pippy can be used to learn "Python" programming language and even to create new activities! E-toys can be used to create virtual worlds and characters, and to model physical phenomena. See OLPC Wiki for more details.

Annex 3: Parent's hand out with community guidelines

OLPC PARENT AGREEMENT

As a parent of

_____

- I will follow the principles of the OLPC Program
- The laptop is for my child's education
- I will look after the laptop
- I will make sure the laptop is safely charged
- I will introduce rules about sharing the laptop at home
- I will make sure the child brings the laptop to school every day

Signed by Parent

_____

Approved by Principal

Issued April 2009

Please encourage your child's OLPC journey of learning

Community consultation guidelines for deploying the XO laptop in communities

- The XO Laptop should be deployed through a process of community consultation; should only proceed with assent of the entire community, taking account of their needs and concerns; and should be fully integrated into existing systems and tools

- Without compromising child ownership or education, access to the XO Laptop should be available not just for the child, but the family and the community

- Communities should develop their own principles and guidance for coordinating communal use of the XO Laptop

- Where appropriate, children should be included and encouraged to actively participate in using the technology for whole-of-community actions and projects

- The technology should be available to contribute to community efforts and solve community problems and not be leveraged for private personal profit or commercial gain

- Knowledge and data generated with the laptop is in the public domain, and needs to be freely available and shared

- Without discouraging community-level market activity which support sustainability – such as microfinance, technical services, spare parts repairs and maintenance – communities should put in place disincentives to the emergence of a secondary commercial market for the XO.

- Communities should share local knowledge, best practices and lessons learned with like communities and within their sub-regional, national and regional contexts.

- Deployment should, wherever possible, proceed in alignment and harmony with existing regional and national efforts on education for sustainable development, and should be designed to strengthen and enhance those efforts.

- An "end-of-life" program should be put in place to recover derelict laptops to avoid environmental damage and hazard

- An Internet Safety program should be established wherever the XO is deployed

Annex 4: Teacher's Toolkit to help with Curriculum Integration

Some attributes of OLPC

The laptops can support the learning objective by:

- Motivating and engaging students
- Promoting creativity
- Promoting collaboration and team work
- Promoting inquiry-led learning (research, etc)
- As a scaffold for higher-level thinking (modelling)
- To promote affirmation and discovery learning
- Tool for investigating reality
- Improving access to resources – massive collections of content online or on the server
- Helping disadvantaged and disabled students
- Promoting support from family / community

Initial questions to ask

- Which attribute(s) of the OLPC are you trying to leverage?
- How will the laptops help learning?
- How will the laptops help teaching?
- Will the laptops add value?
- What is the risk of the laptops diverting your focus? (and other risks)
- Will the laptops give you extra work load? (and if so, is that worthwhile? How can it improve your productivity / efficiency?)

Teaching methods

The laptops can support teaching methods:

- Student centred
- Active Learning
- Group work
- Discovery learning
- Learning by doing
- More time to focus on specific/each child
- Tests / quizzes
- Using multimedia

TOOLKIT – which activities to use?

For each learning objective:

- Use your knowledge of what the activities do
- Get help from each other at OLPC club (Thurs)
- Get help/ideas from regional discussion forum
- This toolkit can be built up with info and tips
- The Wikieducator would work powerfully in this way, to build up a knowledge base

What students need to know

Basic skills	Needed to use laptop effectively alone
Connecting	Needed to use laptop effectively in school and with others
Advanced training	Needed to fully utilise potential of the OLPC

Basic skills
- Basic operation of laptop
- Introduction to activities
- Introduction to sharing

Networking and server
- Finding and connecting to various access points
- Connecting to school server
- Monitoring/checking connection
- Starting and joining shared activities (with teacher and other students)

Scheduled training
- Weekly or monthly plan
- Focus of different activities
- Staged introduction of more complex activities, Internet and school server resources-

- Minimum skill set required for lesson work
- Start / Shut down
- Four views
- Frame and volume controls
- Starting and stopping activities
- Jumping to home page to start / stop other activities
- The principle of sharing
- how to start a shared activity
- How to join a shared activity
- Inviting
- Network awareness; how to tell what connected to, how to change network connection
- Using journal to locate files

Suggestions for teachers' familiarisation

- Complete the students' basic training yourself
- Understand and become confident with some simple lesson ideas for the laptops
- Train the students' in the basics first
- Then start to test lesson ideas using simple list of suggested activities
- As you gain confidence, start with more ambitious lesson planning for OLPC
- Gain experience with email and searching for supporting resources (Wikis), and the server resources
- Understand class management techniques for OLPC use

All year 2 teachers starting now

- This needs doing before starting curriculum related activities
- Each week:
  - o Take up one hour lesson time working through the list
  - o Suggest this is done on Wednesdays
  - o Review/help each other at Thursday teacher's club
- Have a specified time set aside to fix students laptop problems so they don't take up lesson time
- Encourage the Community OLPC club as students will learn quickly that way too

Some simple activities to start with

Poll Activity
- Very easy to use and set up
- Once students know it, very easy to manage in class
- Fits very easily into rich task
- Students can take home polls and ask family
- Come back and compare patterns in their results
- We need to test best way of saving students' results on the server
- Build up a list of suggested poll questions for each rich task theme / week

Measure
- Easy to capture sounds
- Can be saved (click "start record") and inserted in Write
- Suggest table with 2 columns, name and waveform image
- Students can use it to appreciate loudness (amplitude) and pitch (high, low) and tonal qualities of sounds
- Can be paired with TamTam etc

Memorize
- Easily integrated into many rich tasks
- Matching pairs
- Need to try out creating games PRACTICE PRACTICE
- Need to work out best way of sharing the prepared game with the class
- One way is to share with groups of 5 max in turn (everyone else has laptops turned off)
- Students can be asked to try creating games (as an option for advanced students)
- Skill requires knowledge of taking and naming photos, saving (keeping) in journal and recovering in Create game

Write
- Can be a standard tool in many lessons
- Can increase productivity (creating tables is quick)
- Teachers should be aware of where it can help
- Learning about tables
- Learning to classify things
- Saves time compared to drawing tables
- Can insert images and paintings quickly (match picture of object with name or text)
- Be aware of downsides, until you are very skilled
  - it is difficult to collect the student's work
  - Initially students need a lot of help
- Good idea to set them a write task each week

Record
- Can be a standard tool in many lessons
- Can increase productivity (creating tables is quick)
- Students find it very easy
- Must help students learn to name and keep images for use in other activities
- Learn also to use audio and video (including naming and keeping and recovering)

Speak
- Use whenever learning new English words
- Helps students to gain confidence speaking
- Can be used in tandem with Write and Record
- Use together with books or blackboard
- Home work idea
- Students take home list of words or a text
- Use Speak to help learn pronunciation
- Use Record to hear how well they did

Chat
- Good way to encourage group work
- Helps them understand sharing etc
- Get groups started independently
- Small groups or pairs work best or it gets unfocused
- Trick will be to think of guiding the conversation and relating it to the rich task
- Idea: Students write sentences to each other, they then have to speak them aloud, they can use Speak activity to help (one laptop running Speak in each group)

Other simple activities to start with
- Paint (good for home work – paint leaves etc)
- Calculator (try out some sharing)
- Moon and Star Chart (home work , rich task)
- Stopwatch to time things
- Use with Distance or measure distance normally
- Calculate average speeds (higher years??)

- Clock game to learn time
- You can use games like Connect, Memorize

Classroom management
- You don't have to do the same thing with whole class. Have one group using Chat, another doing blackboard work, etc
- You don't have to use every laptop all the time - sometimes just one or two laptops per group to make it more manageable
- When sharing a prepared resource like a poll or memorize game, try doing it in small groups with others having laptops turned off
- Practice and test before hand!!!!

Lesson planning

- An example template lesson plan is provided below.
- Lesson plans can be collected by one support teacher and put onto the Wikieducator. This also allows high quality PDF print outs.

Rich Task : An kiwiwud bwio Naoero, Year 2, Science, Week = 10/11

Lesson Objective	Subtopic	Activity	OLPC related activity	Skills / knowledge to be learned
Compare, identify clarify between sounds	Energy and Force	To be able to identify and measure sounds within the environment using the laptop	STEP 1 Divide class into groups of six. Explain and discuss what children are required to do. Demonstrate with laptop. STEP 2 TamTamMini activity. Play different sounds in activity, Discuss findings, record and compare known sounds in each group. STEP 3 Write activity. Type in recording/findings. Name sounds and type under group column. eg. animal / transport / other STEP 4 Groups choose 5 items to record and capture (items within school boundary) eg. Bell, voices STEP 5 Measure activity Groups combine into one group STEP 6 Compare different wave band according to their findings and discuss which has a higher/lower pitch on laptops.	Comparing sounds Knowing sounds Working in a group Using TamTamMini Analysing and creating categories Expression / writing Using Write (word processor) The nature of sound Sound having patterns Physical properties of sound
Special preparations and considerations				

Task	Subtopic	Aim	Lesson Objective	Material used	OLPC Activity	Method	Skills learned	Evaluation
An Kiwiwud Bwio Naoero "Changing Nauru" or "How Nauru is changing"	Environmental area; issues, influence, impact, recommendation of chosen area	Children to be self sufficient	Brainstorm the children about community groups; Identify the system that produces goods and services; Describe interactions with the environment and how it affects their life; Identify ways that places in their immediate environment have changed and are continuing to change;	OLPC "fishermen"	Record activity Write activity Puzzle activity Memorize activity Poll activity	**Community work** **Step 1** When interviewing "the fishermen" use Record activity. Press "Video" then start interview. **Step 2** After interview press "Photo" and take photos of fishermen, his catch and his canoe (different photos of each type of fish). **Step 3** Keep/save work. **Step 4** Start Write activity. Insert photos of fishermen and fish. Write a story. **Step 5** Keep/save work **Work at school** **Step 6** Children to sing "1,2,3,4,5 once I caught a fish alive.." **Step 7** Open jigsaw activity and press on "my picture". Select a picture (fisherman or canoe) Shuffle and enjoy game. **Step 8** Memorize game with matching pictures of fish, prepared by teacher. **Step 9** Poll activity Make a poll about people's favourite fish to eat. Get 10 votes from family members and bring back to school to compare.	Interview Communicating Story writing Creating Understand Sharing ideas Classifying Sorting Identifying Matching Labelling Using different activities on laptop	Did the children use the laptops as desired? Did they achieve their aim?
Notes and future recommendations:								

Annex 5: Infrastructure

It is advised that servers are installed to cater for the increased number of laptops as the programme develops. One server is needed per double classroom (2 classes of 40). This is needed to ensure good reliability in collaboration. With version 0.6 it will be possible to register laptops in classes (groups). The SPC's recommended solution is shown below. Instructions on cascading the server infrastructure is available on the OLPC wiki.

The "eBox" is a low-cost OLPC "XS" school server solution for rural primary schools. This is available ex-Australia for less than AUD 500 including the screen. It is robust, has no fans, can stand up to the harsh environment and is very low power resulting in low power overhead costs.
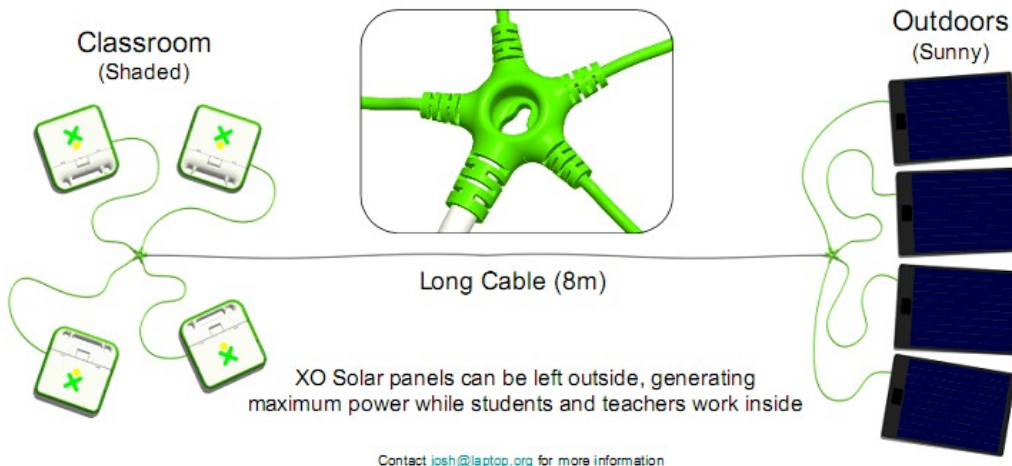

Specification:

- VIA chipset runs on DC using only 20Wm reducing power supply needs
- HDD can have 320GB of resources
- Cost less than SBD 2,500 / USD 350
- Robust
- Runs the OLPC Linux-based XS software, reliable and virus resistant
- Very small and light for shipping
- Good solution for widespread use in both urban and remote schools

The DC Share cable with flexible amorphous silicon panels from OLPC partner company Gold Peak is a very low cost solution where sunny conditions prevail. The DC Share cable (by Belkin, another OLPC partner company) retails for USD 12 and four 15W panels from Gold Peak at USD 40 each (USD 160 total). I have tested the system in Honiara using 2 x 10W Gold Peak panels and two OLPC "XO" laptops. On clear or mostly fine days, the laptops were able to charge up from flat in 3-4 hours whilst being used for 6 hours continuously, and ended up fully charged (i.e. so the child can take it home charged).
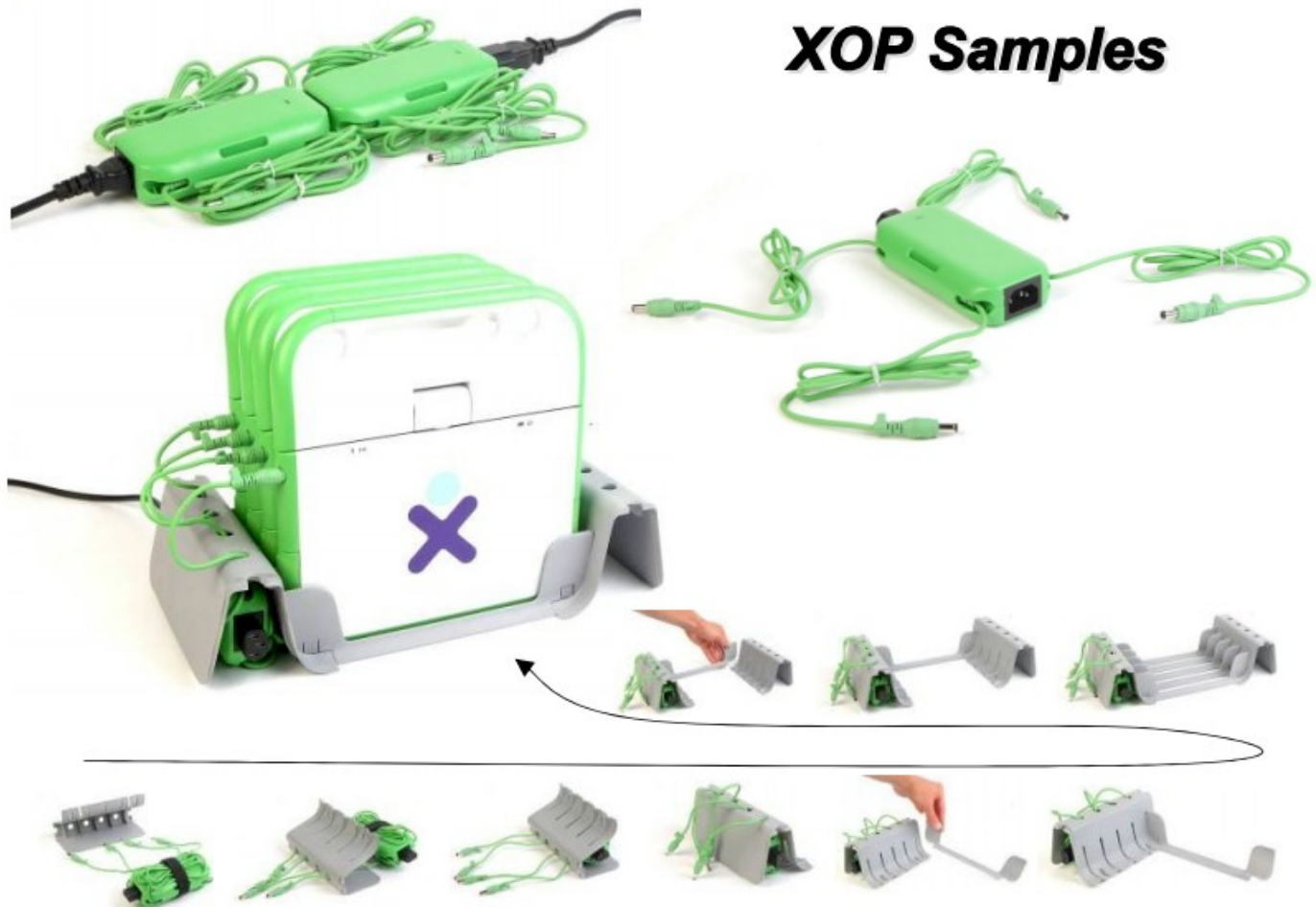

DC Power Share Utilise XO Solar throughout the day

Classroom (Shaded)

Outdoors (Sunny)

Long Cable (8m)

XO Solar panels can be left outside, generating maximum power while students and teachers work inside
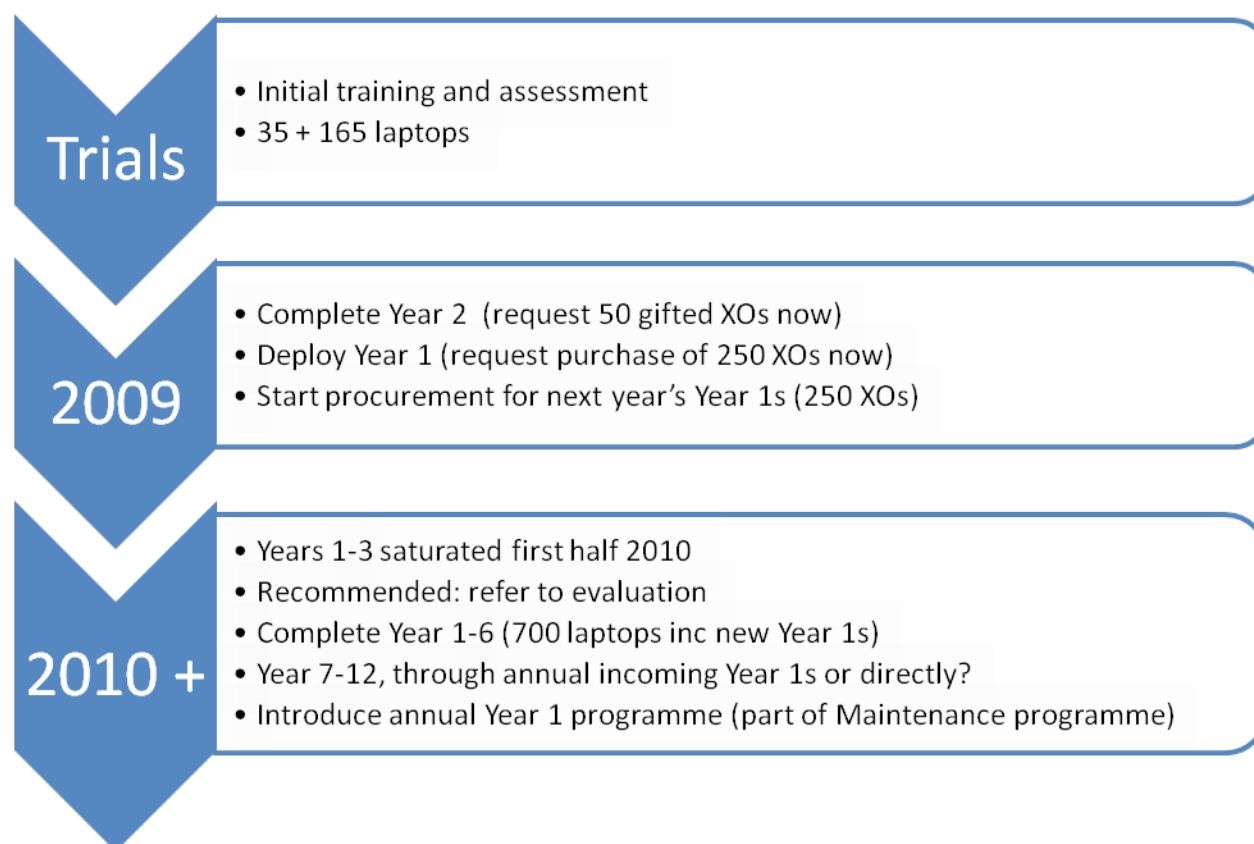
Contact josh@laptop.org for more information

It s also recommended that racks are provided for a safe and practicable charging solution, when large numbers need to be charged in the school. The Belkin racks shown below are available at about USD 50 per 24-rack set of 6 4-laptop modules. One sample module is left at Yaren.

The racks integrate with the "XOP" power cables that will allow 24 laptops to be easily and safely charged from a single power outlet, without a jungle of cables and powerboards. Safety is an issue here, and this is highly recommended purposely designed solution. It can be provided with the laptops.

Note, six 4-laptop modules will fit together into one 24-laptop rack. The XOP cables "daisy chain", and fit in conduit alongside the rack. This is a very tidy solution.

Annex 6: Equipment needs / cost

Trials
- Initial training and assessment
- 35 + 165 laptops

2009
- Complete Year 2 (request 50 gifted XOs now)
- Deploy Year 1 (request purchase of 250 XOs now)
- Start procurement for next year's Year 1s (250 XOs)

2010 +
- Years 1-3 saturated first half 2010
- Recommended: refer to evaluation
- Complete Year 1-6 (700 laptops inc new Year 1s)
- Year 7-12, through annual incoming Year 1s or directly?
- Introduce annual Year 1 programme (part of Maintenance programme)

Example cost estimate:

Year 1:	250
Year 2:	50
Next year's Year 1:	250
Spares and OLPC Club:	50
TOTAL XOs needed:	600

	Price including shipping (approx) USD	Number needed (to saturate Y1-3 by January 2010)	Cost
Laptops	$220	600	USD 132,000
Racks	$50	600 / 24 = 25	USD 1,250
XOP cables	$15 (estimated)	600 / 4 = 150	USD 2,250
Servers	$500 (estimated)	8	USD 4,000

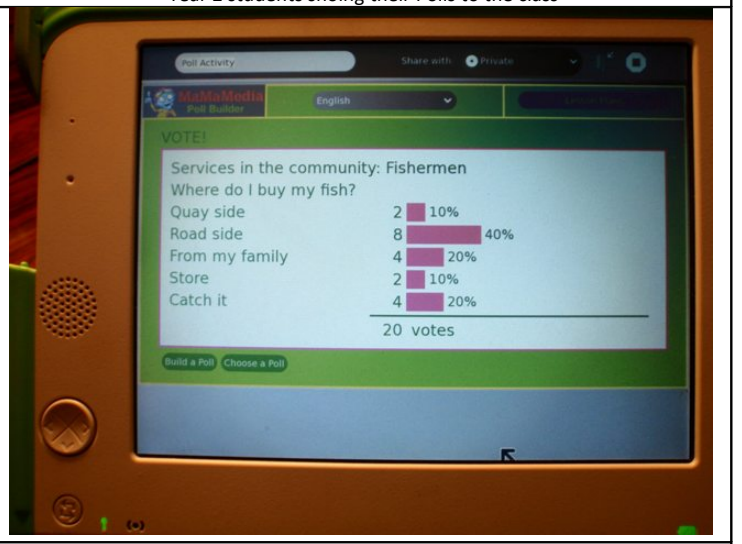TOTAL COST: USD 138,500

Annex 7: Gallery

Year 2 students trying Video Chat

Year 2 students shoing their Polls to the class
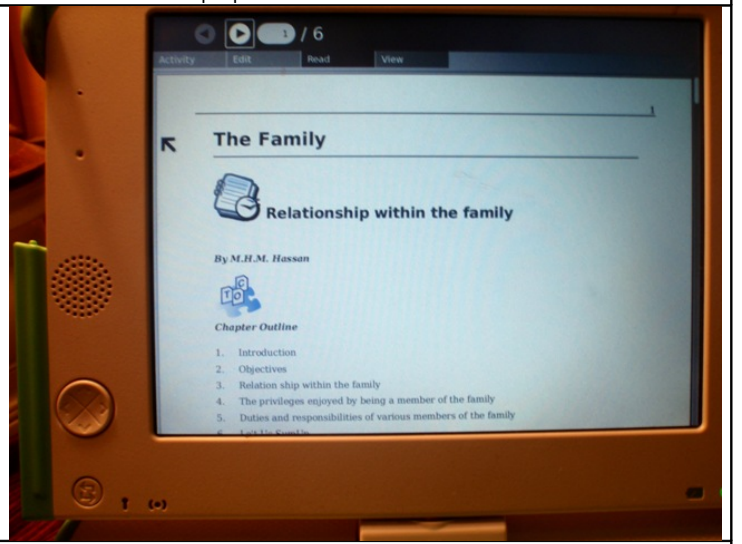

Year 2 students trying Video Chat

Example poll about fishermen from a test lesson

Parents' training session

Example of PDF educational resourcen from Wikieducator, downloaded onto the server, supporting t