SOME FEEDBACK ON CHALLENGES AND IMPACTS OF OLPC

SUMMARY AND GOALS

In summary, the regional priorities for education are embodied jointly in strategies such as the Forum Basic Education Plan, and nationally under the member states' own reform programmes that are supported by various donors. One could say that some priorities are to improve and transform teacher education, curricula, and vocational education, with many voices (c.f. the PRIDE Project) calling for more Pacific cultural relevance and culturally appropriate pedagogy and content introduced into all of these areas, as well as a shift towards more progressive methods such as "active learning" and "learning by doing". There are a lot of challenges with these areas.

As we see it, increasingly reflected in our ongoing trials, the OLPC is an "agent of change" for these desired reforms. However, it is more than that. Because it is not merely focused on academic education, but education in a much wider sense, with capability for bringing educational resources to the wider community in respect to technical and vocational education, distance learning and life skills. Because it brings in a coordinated intervention also comprising communications and electrification, it is also a community access project, bridging the digital divide and with potential economic development impacts across the sectors. Thus, one might best summarise the OLPC as a "human development" programme.

THE PEDAGOGIC IMPACTS OF OLPC

The aims of an OLPC programme are to improve quality and achieve universal access to basic education. The technology is designed especially for children in remote and impoverished areas. OLPC is a transformational technology, because it has the potential to affect widespread change in education. It is also a "catalyst" for wider economic development.

This is in line with the sub-text to the Pacific Plan Digital Strategy of the Pacific Islands Forum, which reads "Reaching Out to Remote and Rural Communities". However, there are also many impoverished urban populations in PNG and these can equally benefit.

To understand the potential impacts of an OLPC programme, one can start with more generally understood impacts of ICT in education, and then focus on the particular characteristics of OLPC, with its core principles, specialised technology and foundations in constructivist learning. We can then study the processes by which an OLPC project can affect change in terms of a traditional school effectiveness model, and the challenges that are presented to countries wishing to implement OLPC programmes. Finally, we must understand the priorities for education reform in the region, in the context of globalisation and the need to steer the reform towards more culturally relevant approaches in education.

A detailed list and diagram is attached in the annex, with a list of attributes, illustrates how the results of an OLPC program must take into account all of these priorities and challenges, together with a reflective management approach informed by an effective, continuing evaluation process.

THE CHALLENGES

In summary, the main challenges are given below, with illustrations of approaches that have been tried with some success during the pilot phase:

(a)   Governance. Building a sustainable coordinating body that ensures government ownership and adherence to education policy and standards, but leverages partnerships with suitable "champion" organisations, usually NGOs including academic institutions, to provide and build the national capacity to run trials, develop a national strategy and then scale up OLPC roll out.

(b)   Teacher Training. We need to train teachers how to integrate the laptops into their teaching and facilitate the children's learning. One strategy is to seed capacity in the teacher education institutions of a country, (as in PNG with Divine Word University and Don Bosco Technology Institute). They are introducing OLPC components into their curricula so that their graduates will have a certified level of familiarity with the OLPC principles and technicalities, which will eventually be accredited in some way by the Department. The teachers of the trials projects are pioneering teaching ideas with the laptops, following initial training. A supportive relationship can be built up with the teaching schools, who can develop new methods of curriculum integrations and so on, and reflect on the experience of the teachers. Included in this challenge is making sure that these activities are linked back to the education system via the school inspectors and local education officers, so that there is adherence to standards and accountability.

(c)   Power infrastructure. This is a technical area, but although the laptops use only 5W each, a large school in a rural area with no grid power presents a challenge to enable recharging each day. SPC is looking at many solutions. OLPC Boston have some very reduced price, appropriate designs for solar power supplies (such as flexible solar panel "blankets" costed at USD 2.50 per W, and multiple channel battery chargers). But over 100 or so and solar power supplies becomes large and vulnerable, so SPC are also investigating innovations such as diesel generators from India and China that run on coconut oil. The three schools in Solomons are candidates for one such system (see http://www.peoplefirst.net.sb/DLCP/Marovo.htm). There are underused copra plantations and teachers say that parents could send more children to school, paying fees with coconuts. Unused oil is bought buy the local company supplying and supporting the generators. A site by site approach is required – as there are often local "work arounds" and partnerships that can help.

(d)   Content and curriculum integration. The OLPC allows curriculum departments to look at new ways of creating and pooling education resources with their neighbours in the Pacific. Related to this, is Commonwealth of Learning's "L4C" Wikieducator training programme in the region, including new ways of collaboration to create an access open education resources. The voices from PRIDE also call out for this. The laptop has the potential to really empower teachers to create their own content, which can be shared more widely, and in direct input to curriculum development. We can also help find sources of local content from other providers, from development programs dealing with conservation, HIV/AIDS, conservation, fishery management, to lifestyle and promotion of the Pacific identity and cultures. For instance the SIL (sil.org) group have "bible translators" all over the region, embedded in communities working closely with primary school teachers. In PNG they have made available several examples of local language "PDF Readers" – electronic books aimed at 6-year olds upwards, on relevant topics and very culturally sensitive.

FEEDBACK FROM THE TRIALS PROJECTS IN PNG

This feedback is in no way a substitute for a proper evaluation. SPC has plans for these, wishing to work with appropriate agencies and institutions. Part of the strategy for the trials is to work with Departments of Education to develop objective frameworks which can be measured. This is the case so far only with the Solomon Islands, where an evaluation framework was drawn up by the Ministry's technical working group as part of their sector wide programme. The framework is attached in the annex.

In PNG, trials were started in June at Gaire and Dreikikir. Only grade 3 was involved in each school owing to availability of laptops at that time. Also, insufficient training was given. However, both sites have been assessed by the Department with the assistance of the SPC advisor, and arrangements made to complete both schools so that all teachers and students will receive laptops, by the end of the year. The implementation will involve full training for teachers and introduction of support and monitoring arrangements. DWU and DBTI playing their roles as described above.

A properly conducted monitoring and evaluation process is required. However, this has not yet been introduced by the Department and the Department is yet to develop an objectives framework and implement the M & E component. However, there are some observations that can be made following the five months since the trials were started in June 2008. The SPC advisor David Leeming visited both schools in November 2008 accompanied by representatives from the Department. Teachers were asked to give feedback.

FEEDBACK ON DREIKIKIR

Feedback from teachers
- Enormous enthusiasm. They really see the value of the programme and the head teacher is requesting the additional XOs immediately.
- Motivation of grade 3s has soared, teachers too. Demand for transfers in to Dreikikir are increasing, and two teachers who have been promoted and have to transfer out were almost in tears as the prospect of leaving
- They have been amazed by the self learning capacity, with learning continuing out of class, and obvious skills and knowledge of the grade 3s. The kids gave a demo and they were bursting with confidence, quite unlike their shy former selves during training in June.
- They have been using the XOs in lessons on a regular basis. Both guided and unguided. Examples, regular use of Record in science to investigate natural objects, calculate, write, speak.
- The teachers say that they totally accept and endorse the "agent of change" characteristic of OLPC, in terms of teaching practices. It is extremely timely as the same intended changes (active learning etc) are part of the current reform process. The XOs fit with that perfectly.
- The teachers report that the grade 3s are noticeably improved in terms of engagement in learning and motivated in and out of class. All children are now more included with fewer children being left out.
- Head Teacher Peter Kantipil did a test with his grade 3 class, giving them a grade 4 task. When evaluated they came out better than the grade 4s. They think this is directly due to their improved learning since June. (Note, a DWU researcher is interested in doing a 2-year study on IQ of students using XOs)
- On the other hand, the other grades are demoralised by not having XOs. This is a real negative impact, and adds urgency to saturate the full school.
- The teachers used the laptops to take photos to add to their attainment certificates in colour (each child has one end of year)
- Community also very positive. During the demo, the kids showed me how they have filmed music DVDs so they can play them on their XOs at home, also one showed me an official letter that his Dad had written using the XO, so its useful at home. But the self learning is well noted by the parents
- Hardware: only 1 laptop u/s (but they will try to reflash it). One has no audio. Others all look pretty well looked after.
- The main issue – power – is solved. They have a robust work around solution, and we can make a more elegant one later. They actually bought a 5KVA generator specifically to charge the laptops, and have been doing a once a week in-school charge with the students finding power in their homes on other days. This is not enough for 300 laptops but can do it in two daily charges. They have grid power in evenings and will get that connected to school buildings. The flat rate is only PGK 15 per month (until the power company works out what is happening with PGK 6 per day being used when 300 laptops charged each day!!!). We designed a sort of shelving arrangement that will allow 300 laptops to be manageably stocked in shelves for charging each day. The gang chargers can be used later, and they are now not dependent on them.

FEEDBACK FROM GAIRE

- The children love the laptops, and have become experts in the eyes of the teachers
- The teachers are extremely positive and don't feel any way imposed upon
- The main observation is the power of the laptops in helping the children to learn and discover things, beyond the school. They have become experts
- One example, they have already discovered creating games with "Memorise"
- The children have become very busy in the classroom – i.e. very engaged in what they are doing
- They are very impressed with the creativity of some of the students, for instance the standard of drawings using Paint is quite out of the league of the adults!
- The G3 teachers use the laptops quite a lot in class, both guided and unguided. They can allow the students quite a lot of freedom to use activities to tackle various tasks.
- One teacher listed some guided uses:
    o Write
    o Calculate
    o Tamtam
    o Paint
    o Chat (they found it is quite useful in class)
- They did a school survey that involved creating music with the laptops
- The deputy head teacher has a G3 child, and he has made a lot of positive observations. He could also speak as a parent. He gave his child a question on science, and the child researched the answer on the Internet! This is a grade 3, 8 year old.
- Teachers have been using/borrowing laptops to research material for their lessons, as well as downloading materials and sending emails.
- The children line up outside the RICS and use the Internet quite often
- This is evidence of the added value of the RICS
- As with Dreikikir, the ones without laptops have been a bit demoralised. One teacher very eloquently explained that until the whole school was saturated, judgement on the laptops is unbalanced.
- Teachers were very aware and supportive of the need to monitor and evaluate, and to involve the Province in this task
- Two laptops of the 53 had problems, one has half the screen distorted (horizontal lines) and one has the dead battery syndrome. We managed to get the battery charging again although it is only very slowly taking up charge.
- They could not think of any negative impacts.

OTHER FEEDBACK

- Two members of the Department accompanied the SPC advisor to Gaire on Sunday 23rd November and witnessed the skills demonstrated by five Grade 3 students and their teachers, in preparation for the demonstration at the press conference scheduled for Parliament. The students displayed advanced skills and the teachers illustrated guided learning.

- The Gaire teachers reported a visit by School Inspectors, who witnessed Grade 3 lessons with students using the laptops. The teachers stated that the inspectors were very impressed.

- There was one report of misuse of a laptop at Gaire (by an adult). The authenticity and timing of this report is uncertain, as the RICS system has been running a content filter for some time now. The appropriate child protection strategy is included in the annex.

There is some excellent indication of the potential with children with disabilities. When DWU conducted teacher training for 87 teachers from schools in the area at St. Benedicts in October, they invited people from Callan Services, an international NGO that has centres around PNG helping people including children overcome disabilities. Some teachers from Callan Services in Wewak attended the DWU training and immediately saw the potential. Dr

Alfred Tivinarlik, Dean of St. Benedicts, captured on video the Callan Services teachers using the laptops to create visual resources for teaching sign language. They also have a centre in Kiunga, where PNG Sustainable Development plan to start OLPC projects in their areas of interest.

(David Leeming reports....) *I also visited the Mt Hagen area, where PNGSDP hope to start a project "exhibition school" at Kisap near Banz, and visited Sister Rose at the nearby Shalom Centre (Banz), a centre for people diagnosed with HIV. We discussed how we might link that in some way to the street children who had been pointed out to me at the market. I remembered that in the early days, we were primarily thinking of the children who did not attend school, but the focus has now become centred around schools - probably as it is easier to manage. But those children do not attend school - a visible side of the 50% who are not at school in the 6-17 age group. We discussed ways in which the residents at the centre might somehow use the laptops to share their stories, in some way working to involve children not at school. Not sure how that will develop but it shows the range of possibilities. I am increasingly seeing OLPC as a sort of transformational technology - not a phrase to use lightly - due to it's potential widespread impacts. First Secretary Seri Hegame rightly described the OLPC as a human development program*

OLPC AS A CATALYST FOR WIDER ECONOMIC DEVELOPMENT

An OLPC program is not just about laptops. Because it is a coordinated development program, that involves the whole of a community, it brings with it not only improved basic education but bridges the digital divide. The OLPC programme will bring with it (by necessity) an integrated approach power and communications infrastructure in the rural areas.

In terms of educational benefits, the program can extend from the schools into the communities. There are many potentials in terms of human development, and linkages that can be made.

References

http://laptop.org

http://wiki.laptop.org/go/OLPC_Oceania (and see PNG page for photographs and video)

Other references at end of annex 1.

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Dec 2nd 2008

ANNEX 1: THE POTENTIAL EDUCATIONAL IMPACTS OF OLPC

INTRODUCTION

To understand the potential impacts of an OLPC programme, one can start with more generally understood impacts of ICT in education* [1], and then focus on the particular characteristics of OLPC, with its core principles, specialised technology and foundations in constructivist learning [2]. We can then study the processes by which an OLPC project can affect change in terms of a traditional school effectiveness model, and the challenges that are presented to countries wishing to implement OLPC programmes [3]. Finally, we must understand the priorities for education reform in the region, in the context of globalisation and the need to steer the reform towards more culturally relevant approaches in education [4].

*Note that many ICT initiatives in Education start with a Computer lab model. OLPC put the laptop in the hands of the teachers and learners all the time so that they can use the tool whenever they need to learn. This is a very different approach gives very different results.

DIAGRAM

The diagram at the end of this article illustrates how the results of an OLPC program must take into account all of these priorities and challenges, together with a reflective management approach informed by an effective, continuing evaluation process.

THE XO AS AN AGENT OF CHANGE FOR EDUCATION IN PACIFIC

In many overseas countries, OLPC has been effectively used as a Change agent for the education system and in fact, the OLPC program was designed around this principle

- Helps integrate and support local cultural values into education system,
- Helps shift to more culturally relevant ways of learning
- Opens up new ways of pooling and sharing resources, and for collaborating, especially across the region
- Offers new highly scalable approaches to the localisation and development of relevant educational resources
- Helps change form a Teacher centric model to a Learner centric model
- Facilitates bridging of distance in teaching, learning and education
- Helps shift focus of educational goals to lifelong learning, communications and IT competence, information-based employment, etc
- Helps build intercultural communities of learners and educators within the Pacific to counter the dominance of external influences

LEARNING ENVIRONMENT

- Teaching methods are affected positively through the use of the XO in T & L, including more/improved:
    - Guided Learning by Doing
    - Learner-focused teaching
    - Group learning /sharing/collaboration
    - Inclusion / engagement of all students
    - Curriculum development to suit the new environment
    - Impacts seen in all education sectors, but mostly with early age education (ECE and PE)
- Active learning and authentic assessment is promoted by the ICT. Examples:
    - Using the Record activity to photograph natural objects studied in science
    - Interacting with students in another country via e-collaborative activity
    - Using TamTam to simulate music from other cultures
    - Using the text-to-speech sythesisor (Speak) to learn how to pronounce new words (i.e. in English)

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- The XO is used to investigate reality and build knowledge
  - Through scientific and measuring tools on the XO
  - Through learning research skills with improved access to resources, on server and via Internet
  - By collecting and analyse data, using the XO
- Impacts on basic education:
  - Basic literacy and numeracy improved through specific reading/writing and numeracy activities on the XO
  - Localisation features help implement teaching in the vernacular for early ages
- Improved engagement of students by motivation and challenge, for example
  - Using the word processor (Write) activity with the multimedia functionality to create autobiographies, etc
  - Solving problems using the scientific tools
  - Using the XO adds variety and stimulation
  - Learning embedded in games formats, with multiple levels of challenge
- The technology provides tools to increase student productivity
  - Using the XO to reduce repetition of low-level tasks and through sharing and building
  - Teachers can review students work on line
- The ICT is used as scaffolding to promote higher level thinking
  - Modelling / visualisations tools / activities on the XO
  - Allows a deeper study of issues through access to better resources
  - Using word processor (Write) to edit narratives into different tenses, etc.
- Increased learner independence through use of the ICT
  - Students learn to research and self-learn
  - Access to educational materials and learning via distance
  - Development of Information Literacy skills
- Increased collaboration and cooperation
  - The XO is unique in that collaboration is a core functionality and principle
  - Group work and activities
  - The ICT can enable participation in activities beyond the school, for instance a marine conservation project involving schools throughout the region
- Learning is tailored to the learner
  - The Speak activity can be used to read out aloud text from a book, etc
- Physical disabilities can be overcome
  - Through improved community education, changing attitudes to disabilities
- Curriculum and supplementary content made available electronically via school server
- Resources made available over the world wide web for
  - Professional development of teachers
  - Research by students
- ICT helps teaching practices to be more culturally sensitive. More regionally and locally relevant curriculum resources made available. Examples include:
  - Intercultural exchange within the region is made easier
  - Sharing of educational resources between countries in the Pacific becomes possible
  - Local content development by teachers made possible, locally and collaboratively over distance
- ICT helps teaching practices keep in tune with student attitudes/aspirations, which are changing because of globalisation.
- Enables teaching and learning of information literacy
  - Developing skills for the Knowledge economy

SCHOOL ENVIRONMENT

OLPC projects around the world have seen an improved relationship between the school and the community. This comes from

- Increased enrolment or improved attendance, absenteeism of teachers and learners reduced
- Improved discipline

- Teachers have improved morale and work together to learn to use the laptop
- Parents take a stronger interest in their child's education
- Computers used to inform school administration on student performance, enabling effective change
- School administration more effective
- Higher demand / enrolment / retention (teachers and students)
- Teachers and students regard the XO and OLPC project positively

TEACHER DEVELOPMENT INDICATORS

An early indicator of development in teachers is to see the teaching resources they are using and any professional development work they are engaged in. OLPC facilitates
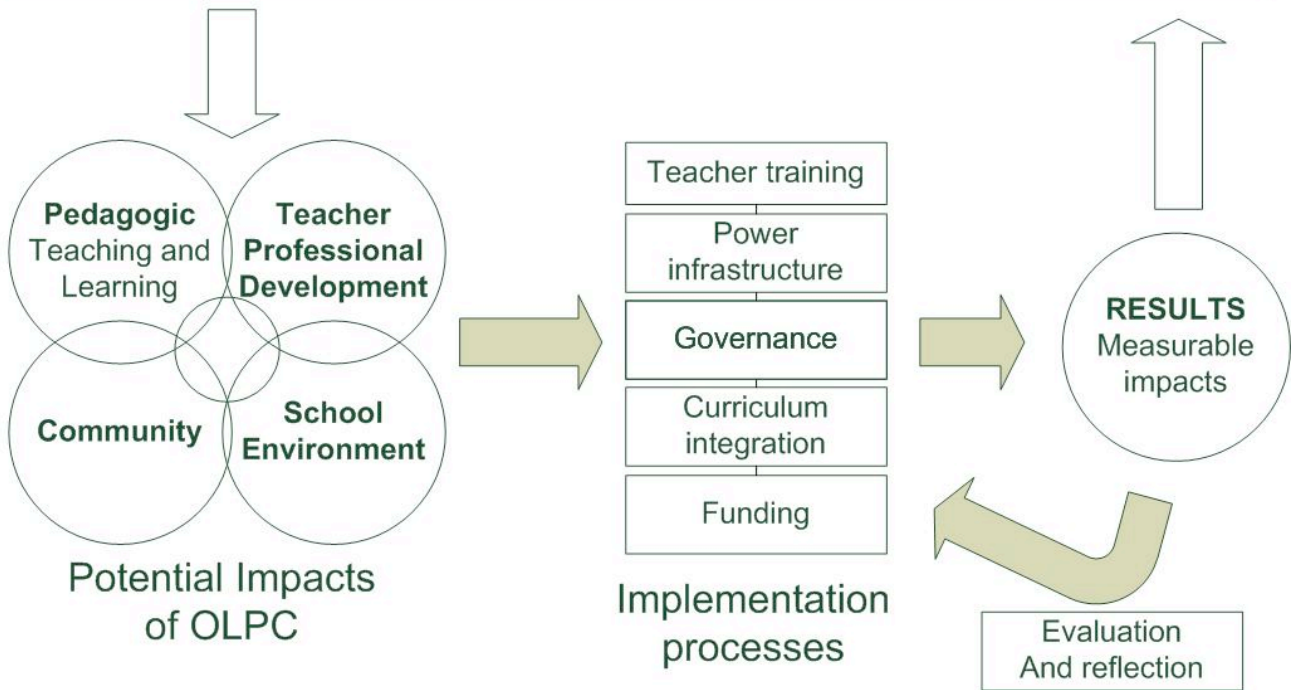
- Networking and collaborative tools such as UNESCO-TOFI and 'Wiki Educator' used by teachers
- Local content developed by teachers and students
- Teachers receiving training support via distance mode, and access to continuing education
- Teachers are able to integrate the use of XO in formal and informal class-work
- The XO is used in Teaching and Learning
- Teachers have improved access to resources and training support

THE SCHOOL WITHIN THE WIDER COMMUNITY

- School seen more positively by the community
- More involvement or active participation of parents in the school
- Using the ICT to enable learning activities that involve the community
- Community have improved access to information and communication services
- Rural economy benefits from improved communications

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Education Reform in the Pacific
Regional and National Education Action Plans
Improving access and quality of basic education

Globalisation

Localisation /
Pacific culture

Pedagogic
Teaching and
Learning

Teacher
Professional
Development

Community

School
Environment

Potential Impacts
of OLPC

Teacher training

Power
infrastructure

Governance

Curriculum
integration

Funding

Implementation
processes

RESULTS
Measurable
impacts

Evaluation
And reflection

ANNEX 2: SOLOMON ISLANDS OBJECTIVES AND EVALUATION FRAMEWORK

Objectives	Expected outputs	Indicators and instruments (how it is measured)
Awareness raised about OLPC and the objectives of the trial in Western Province	Ministry, teachers, sector partners and communities aware of: The vision of OLPC The function of OLPC/XO/XS Objectives trial in the Western Province.	• Consultation and briefing meetings held with the Ministry, schools and communities Interviews and survey
To assess the impact of OLPC in the area of Teaching and Learning (In each sub-sector: Early Childhood, Primary, Secondary, TVET)	• The XO is used in T & L at schools and centres The XO is utilised in particular for some of the subjects The XO is integrated into normal/formal T & L-formal education delivery Teaching methods are affected positively through the use of the XO in T & L, including more/improved: (a) Learning by Doing (b) Child-focused teaching (c) Group work/sharing/collaboration (d) Inclusion / engagement of all students (e) Curriculum changes as a result of the XO/OLPC project (f) Impacts seen in all sub-sectors, but mostly with early age education (ECE and PE) (g) Also assess any possible negative or non-impact; learners and teachers not using XO or only after school hours	• Interviews and surveys with school managers, teachers, students, students, community members Teacher log books/diaries Class observations Demonstrations by teachers about the workings of XO Increased use of XO by learners in formal lessons and after school hours
To assess impact of OLPC on enrolment or attendance	Increased enrolment or improved attendance at selected schools compared to schools where OLPC or XO has not been introduced	• Attendance register
To assess impact of OLPC or XO in delivering/producing new curriculum materials/learning content	• New electronic content made available (in schools) The school server is an effective source of content 'Wiki Educator' more frequently used	Materials provided by School Ministry/curriculum NGOs / partners of education sector OLPC Oceania / SPC
To assess if OLPC/XO-technology is technically feasible and sustainable	• Teachers and students are able to use and continue to use the laptops Power supplies are feasible , affordable Good quality Internet connectivity Required level of technical support, maintenance is available XO-Equipment is reliable, functional and still working Interviews, consultations and surveys	• Demonstrations by students, teachers Technical report on power and connectivity infrastructure Options, performance, cost, Number and type of equipment failures
To assess impact of capacity building for teachers (and learners) in the OLPC project	• Training (for XO) has built sustained capacity Training system/schedule and methodology is effective Teachers are able to integrate the use of XO in formal and informal class-work Teachers have improved access to resources and training support	• Interviews, consultations and surveys with trainers, teachers and learners Evaluations of training, capacity building

To assess the impact of OLPC on the learning, and school environment	• Teachers and students regard the XO and OLPC project positively School seen more positively by the community Teachers have improved morale Absenteeism under teachers and learners is reduced Higher demand / enrolment / retention (teachers and students)	• Interviews, consultations and surveys with teachers, learners and community members School records, minutes of school board/committee meetings Public meetings Parents meetings Inspectorate visits Note: OLPC/SPC will provide advice on survey instruments/questionnaires/inspections
To assess the impact of OLPC, XO's on the community	• To assess the impact of OLPC, XO's on the community Also community members involved in the use of XO's Community regards the OLPC positively or negatively Community have improved access to information and communication services More involvement or active participation of parents in the school	• Interviews, consultations, surveys with community members, teachers, learners Minutes of school committees and boards Group interviews with community members Demonstrations of parents using these XO's