INTERNATIONAL WORKSHOP ON CAMPAIGN FOR 1 MILLION PCs FOR AFRICAN SCHOOLS

Johannesburg, South Africa
13-14 October 2004

WORKSHOP REPORT

SchoolNet Africa
SchoolNet South Africa
Global eSchools and Communities Initiative
International Development and Research Centre
Open Society Initiative for Southern Africa

CONTENTS

1. INTRODUCTION

This report outlines the proceedings of the *International Workshop on the Campaign for 1 Million PCs for African Schools* held in Johannesburg, South Africa on 13-14 October 2004. The Workshop was hosted by SchoolNet Africa in partnership with the Global eSchools and Communities Initiative (GeSCI), the International Development Research Centre (IDRC), the Open Society Initiative for Southern Africa (OSISA) and SchoolNet South Africa (SNSA).

1.1 Workshop Objectives

The Workshop's objectives were

- For an international network of practitioners and decision-makers to engage face to face, share information and experiences and debate solutions to challenges related to ICT access in African schools
- To discuss the most recent research findings on issues related to affordable ICT access including case studies on African experiences with particular reference to second hand and refurbished PCs
- To discuss implementation strategies for the first phase of SchoolNet Africa's *Campaign for 1Million PCs for African Schools*.

1.2 Participants

Workshop participants included representatives from organisations and groups in Africa and internationally involved in issues of access to ICTs for schools and communities. They included representatives from UN Agencies such as the UNDP, schoolnet related organisations such as the Global eSchools and Communities Initiative (GeSCI) and the NEPAD eSchools Programme and national schoolnets from 11 African countries as well as international donor and development agencies such as the IDRC, OSISA and Catalaysing Access to Technologies in Africa (CATIA) and the private sector such as Hewlett Packard, Cisco, Microsoft and Direqlearn. Both African NGOs such as CECS, Netday and Ungana Afrika as well as international NGOs such as Free Geek International, Computer Aid International and World Computer Exchange were also present. A full list of workshop participants is attached as Appendix A.

1.3 Partner Organisations

Partner organisations are those that contributed financially to the Workshop and supported the participation of workshop delegates. The major partner organisations were:

- Global eSchools and Communities Initiative (GeSCI)
- International Development Research Centre (IDRC)
- Open Society Initiative for Southern Africa (OSISA)
- SchoolNet South Africa (SNSA)

2. OPENING SESSION

Ms Shafika Isaacs, Executive Director of SchoolNet Africa, opened the workshop with a warm welcome to the participants. She indicated that there has been an overwhelming response to the announcement of the workshop and that SchoolNet Africa has had to close applications for attendance. This reflects the level of interest in the issues that the Workshop will be discussing.

Mr Peter Nolan, Communications Director of GeSCI, gave a brief presentation about GeSCI. He highlighted that it was launched at the World Summit on the Information Society (WSIS) in Geneva in December 2003 by Mrs Nane Anan and that it is an initiative of the UN ICT Task Force. He said that GeSCI is a partner and active supporter of SNA's *Campaign for 1M PCs* and that it is also focusing its work in a few countries such as India (Andhra Pradesh) and Jordan and GeSCI has also been approached for support by countries like China.

Mr Ashraf Patel, ICT Programme Officer for OSISA, said that OSISA has been a founding partner of SNA and has invested significantly in the *Campaign for 1 Million PCs*. He indicated that they have invested $200 000 USD in the Campaign and called on donors to match this contribution. He also informed the workshop of OSISA's low cost computing triangular approach to ICTs for Development in Africa. This includes low-cost access to the Internet, Free and Open Source Software and low-cost hardware. He also said that the time had come for more implementation, less workshops and research and that if there is to be another workshop, it should be in Northern Namibia or in a rural area.

Ms Heloise Emdon, Senior Programme Officer commended the workshop organisers and indicated that IDRC initially supported schoolnets in a number of countries in Africa and are now focusing on innovation. She said that no case still needs to be made for what computers can do for education. The time is now for governments to make decisions to scale up.

Mr Laolu Sasore, Co-ordinator for SchoolNet Nigeria, delivered a speech on behalf of Mr Eric Yankah, Chairman of SchoolNet Africa who could not attend the workshop. Mr Yankah's speech mentioned the coincidence of the workshop with the African Development Forum hosted by the UN Economic Commission for Africa in Ethiopia. He reminded the audience of the endorsement of the formation of SNA at the first ADF in November 1999 and that since then SNA has grown and learned much. Mr Yankah's speech is available at http://www.schoolnetafrica.net/1491.0.html

Mr Tom Musili, Executive Director of Computers for Schools Kenya, wished the workshop well and spoke about the progress they have made in Kenya with the support from IDRC. He indicated that they sent a representative to Canada to spend time with Computers for Schools Canada.

Ms Shafika Isaacs chairing the session took the workshop through workshop expectations, concerns and proposed ground rules for participation.

3. RESEARCH FINDINGS TO DATE

3.1 SchoolNet Africa Research Report

The presentation of the SNA research report which was supported by the Commonwealth of Learning (COL) and the International Institute for Communication and Development (IICD) is available at http://www.schoolnetafrica.net/1491.0.html. The research findings were presented by Ms Shafika Isaacs and Ms Sara Kyofuna from SNA. They highlighted the consultative and inclusive process of the research, that the research outputs included a range of materials in addition to the report and focused on some of the key findings of the research including clarity on definitions from a that of a new PC to a 'dumped' PC. They also reiterated that since the research was conducted in 2003, much of the information is now dated.

3.2 Total Cost of Ownership (TCO) Study

This study was supported by the DFID's CATIA programme and was conducted by OpenResearch. The presentation is available at http://www.schoolnetafrica.net/1491.0.html. The research was presented by Mr Alistair Otter and Mr Alan Finlay of OpenResearch which is based in South Africa. Their presentation also commented on working definitions and concurred with the definitions provided by the SNA team. Their study compared the total cost of ownership differences between new and second hand PCs over a five year period. They addressed issues of PC lifespan, e-waste, direct and indirect costs, replacement costs and TCO drivers.

3.3 Points Raised by Discussants

Mr Tom Musilli from Computers For Schools Kenya, Ms Allen Luyima from SchoolNet Uganda and Mr Muroro Dzurini from Computers for Africa Zimbabwe responded to the research findings. Together they highlighted the following points.

- The lifecycle of PCs in leasing schemes are lower, down to 18 months to 3 years
- The economics have changed significantly over time. The cost of new PCs is dropping, which means the differential between new and refurbs are smaller. Bottom of the range new PCs are now around R2500-R3000 ($460 USD)
- In Kenya, the same brand is not necessarily an issue.
- School buy-in and participation is important. Schools in Kenya will pay for maintenance.
- It is important to develop a strong team of trained technicians
- Proper packing and transportation reduces breakages
- Need to reduce the total cost of ownership in schools especially where there is no budget
- The availability of spares and volunteers often add value.
- The process needs to be integrated into national education policy plans
- We need to consider depot charges, forklifiting, duty charges.

- In Uganda, we recently received a container of PCs that were all faulty
- We also lose confidence if the PCs look different
- The ISO 9001 and ISO 1401 – WEEE directives have important implications
- Second hand PCs do not have to come fro outside only. We can tap into local corporations.
- Refurbished Centres and Technical Service Centres (TSCs) are importantly also centres for teacher training and development and distribution of learner-based education content.
- With the TCO model it is hard to put cost on a comparative basis and we have recommended that SNA also considers the Strategic Value Analysis.
- Our cost analysis suggest the price at $160 USD per PC including deployment cost

3.4 Points Raised in Plenary Discussion

Points raised in general discussion include:

- TCO model – yes or no? It is not about an absolute yes or no. There are vastly different conditions.
- There needs to be back-up support
- It depends on what we are using the PCs for.
- In CECS there have been problems with brand names in terms of supplying parts. Generic parts are less costly
- Technical expertise and sourcing technical parts are very important.
- The baseline research by CATIA is extremely useful but what is missing is the real cost differentials: branded Pentiums vs branded second h ands vs branded refurbs.
- Prices are coming together but we are not talking apples and apples
- Differentiating factors – PC stand alones or networked PCs
- CFSK model is an entry level model
- There has been difficulties sourcing PCs locally as corporates are reluctant to pass on their PCs. They need to be lobbied to understand that it is about extending the useful life of PCs.
- In Mozambique different options are being tested now. Brand new PCs vs refurbs on different platforms and solutions as well.
- In Uganda, the use of student apprentices work well because learners learn faster. SchoolNet Uganda has quarterly technology inspections.
- Free Geek Inc also deals with end of life issues and are keen to share experiences
- Open Source Software plus a comprehensive system of sorting and separation is important. It is not about putting cost into hardware but focus on the warmware. Hardware should be free.
- In Kenya volunteers were sent to Canada for training. They also operate on a Microsoft platform and are working on using other technology platforms.
- In Uganda, SchoolNet Uganda has a position of technology choice and neutrality. They use both open source and Microsoft platforms
- World Links Zimbabwe and CFAZ are also technology neutral and importantly also, non-exclusive. For them everything has intrinsic value – one will not find a PC in a landfill in Zimbabwe.

3.5 SchoolNet South Africa Case Study

This study was supported by the IDRC and was conducted by SchoolNet South Africa. The presentation is available at http://www.schoolnetafrica.net/1491.0.html. The presentation was given by Mr Ian Braid who represented SchoolNet South Africa. He provided a comprehensive overview and experience with two flagship projects of SchoolNet South Africa known as the SuperCentres Project which involved 100 schools and which used new networked PCs and the iLearn Project which involved 200 schools but which used both new and refurbished PCs. Both projects ran concurrently between 2000 and 2002. He also highlighted and compared experiences elsewhere in Africa and internationally, particularly in Canada and Colombia.

3.6 Points Raised by Discussants

Ms Janet Thompson, Mr Gerald Roos from SchoolNet South Africa and Edward Holcroft from NetDay SA acted as discussants. They raised the following points:

- Two projects in the case study have run concurrently. They concluded that with Thintana refurbs were a waste of time but through this study it is evident that this is not the case and that there were a number of factors at play and that it was not as simple as that
- Clear that stand alone PCs also have their limitations
- The Sue Cohen matrix of levels of computer use is very useful.
- Training in the programme was generic and did not relate to the own contexts of teachers. They introduced modules of choice.
- There were limitations and inadequacies with technical training.
- It was useful to involve students in problem solving especially with computer breakdowns.
- It is evident that a needs driven approach is important in terms of what is put into the schools

3.7 Points Raised by Plenary Discussion

The following points were highlighted in the discussion

- South Africa does not seem to have a coherent, national programme on school networking compared to Namibia, Mozambique and Botswana. There are a number of individual initiatives and government led programmes at provincial level which do not collaborate at national level.
- South Africa has the advantage of a Universal Service Fund, a Universal Service Agency which does not seem to be exploited fully.
- National schoolnet practitioners need to be lobbying for universal service by campaigning for subsidised or free internet access to schools.

4. CAMPAIGN FOR 1M PC'S

4.1 Overview of the Campaign

The presentation highlighted the background and objectives of the Campaign and raised targets and ideas for implementation for the first two year phase of the Campaign. The presentation is available at http://www.schoolnetafrica.net/1491.0.html

4.2 Group Discussions on Campaign Issues

The Workshop divided into five groups to discuss different aspects of the Campaign. These included

- Sourcing the first 200 000 PCs
- Setting up 10 Technical Service Centres on a Sustainable Model
- A Capacity Building Plan
- A Global Partnership Plan
- Technical Solutions to Using Refurbs Effectively

After considerable discussion, the rapporteurs for each group presented the following reports.

4.2.1 Group 1: Sourcing the First 200 000 PCs

The following points were raised in the group discussion:

- Most PCs will come from developed countries although PCs will also be sourced locally
- A system is required that brings costs to a minimum
- In the past 5 years 50 000 PCs were received by schoolnets in Africa
- Many donations have not been tracked down because they have not gone through schoolnets
- Consideration has to be given to the payment of handling fees, shipping, duty tax and VAT as well as storage in warehouses and there is room to transfer costs to donors by asking then to pay for disposal.
- The group came up with a figure of $10 M USD for 200 000 PCs. Not yet in the schools.
- Schools will have to contribute towards getting the PCs from customs to the schools and this comes to 50% .
- Governments may not contribute but could reduce taxes
- Consideration should be given to revolving funds to which schools can contribute – a trust fund locally like in Kenya
- Consider working with international NGOs such as WCE, DL, CAI, ICT4Africa
- The targets also means that we need on average up to 50 000 PCs in a month.

The main points raised in the discussion after the group report were:

- The cost of $50USD per PC landed in Uganda is way too high

- The price should actually be half of that - $25
- Target should be $0
- Funding mechanisms must be there
- Target figures of $10M is definitely doable in two years.
- Not feasible to distribute from customs to the schools, distribution has to be done through the TSCs
- Need for sourcing organizations, to adopt an industry standard and streamline operations and not just channel but focus on shipping to TSCs and distribution channels to schools
- Sense that numbers given – 200 000 easier target than first assumed
- Sounds like, target may be quickly be achieved.

4.2.2 Group 2: Setting up 10 Technical Service Centres

This was a very large group, attended by people with experience. The following points were raised in the group discussion:

- Concerns were raised as to the issues that may affect a country to set up a centre
- Governments and bureaucracies need to work closely but some independence should be given to the TSC
- Government regulation and policy on import duties are required that relax import duties on PCs designated to schools
- The group recommended that there should be independence of the TSC and how it could work with partners to achieve its objectives
- The group recommended 10 000 square feet if looking at a central TSC – this is 1000 square meters.
- Consideration should also be given to a decentralised model – refurbishment done in schools
- Under this model - importance of sustainability – empower local companies to set up small scale businesses contracted to support the schools
- Schools are far and wide apart.
- Human resource requirements involves up to 40 individuals – refurbishing 2 PCs per day per person and the human resources needed for deployment should include 5 teams of 2 individuals to deploy
- Country schoolnets should consider existing commercial refurbishers as well and collaborate with them.

The main points raised in the discussion after the group report were:

- Consideration should be given to using technical colleges
- Are TSCs viable in the long run? Some certainly are. Can they charge some fee to make sustainable. This becomes important for sustainability.
- Consideration should be given to collaboration with existing commercial refurbishers
- 1000 square meters should refurbish 1000 PCs per month
- ISO 9001 is important for the overall programme

4.2.3 Group 3: Capacity Building

This was a small group. The following points were raised in the group discussion:

- Overall objective of the capacity building process was how it fits into overall picture of schoolnet objective
- The skills needed for training to set up and manage technical service centres have to be considered
- Ensuring continuity and sustainability is important
- Skills needed include help desking, trouble shooting and managing the TSCs
- There is also neeed for capacity in pedagogical and educational issues to work alongside the technology aspects
- There are processes in place in some countries but not others and there is a need to take stock exists in various countries.
- Emphasis was placed on the fact that capacity building is a continuous process
- There is a need for champions and mentors in the countries and in schools
- An issue was raised about whether to target teachers for training or learners? Teachers are generally less confident in taking on new skills. It is better to focus on students who are younger more open to learn new things and who can work with other fellow students.

Points raised in discussion included:

- Did the group consider the supportive role of international volunteers?
- What role can the community play in this? Unemployed youth can also be brought in.

4.2.4 Group 4: Partnership

This was a sizeable group which set itself the following objectives:

- Discuss process of collaboration for everyone to have access to education and a PC.
- Discuss vehicle through which people who want to participate can participate
- Prioritize partnerships and what to focus on
- What are expected of partnerships – to what end are these partnerships. There is a need for a compelling story.
- Discuss the critical success factors to which all can contribute towards. All elements in the chain need to move from being independent, stand along components to more collaborative partnerships.
- Needs to be driven by end users and has to be an African-led initiative.

The group made the following assumptions:

- The one million PCs campaign is only a start
- Collaborative partnerships are fundamental to the success of the campaign
- This is an end to end solution
- This is demand driven
- There needs to be mechanism for monitoring the performance of partners

The question is one of process – how to build global partnerships. There are three phases of communication:

- First relates to advocacy – broadcasting the message widely
- Then narrowing the message to target groups – need to tailor the message for these groups
- Then move to one on one discussions with specific potential partners

The group also discussed

- The need to be aware that all the messages that are going out for this initiative competes with other messages.
- The need to elaborate on what we want to achieve and how we are going to measure it.
- Need to itemize the types of partners required that will make this campaign sustainable
- For the broadcasting element, use should be made of good partners to help advocate messages. These could include international and regional initiatives as well in country initiatives.
- The private sector can contribute technology and finance. Government has a role in communicating this strategy. There should be a national strategy with government as the lead partner.
- The Public sector can provide a favourable legislative environment, public support, champions and finance. They can also be advocates for the programme.
- The civic sector – need to work together and align with strategic direction and synergies. They can contribute skills.
- All partners need to have an alignment of strategic directives.

The messages from the group were:

- This initiative can have an impact on market and demand
- The campaign grows education in Africa. It is about releasing education which has an impact on GDP and poverty
- Campaign is not about access to PCs only but about supporting the provision of a total education solution

The points raised in the plenary session were:

- Statistics should be available on needs for skilled labour in the ICT industry to support need for and impact of campaign.
- There needs to be principles in place that underlie the process. These could be principles such as transparency, inclusivity, openness and open standards. Needs to encourage local entrepreneurship.
- Another underlying principle is empowerment of countries to own their own resources and skills. Sovereignty of country is paramount.

4.2.5 Group 5: Technical Solutions for Effective use of Refurbs

This was a large group who raised the following points:

- In Namibia, the model is based on the use of LTSP on top of OSS distribution with content resources called the DireqLearn OpenLab solution. It works well in small lab environment and there is confidence that it can scale for large lab environments with 20+ computers. It is a thin-client model using hybrid solutions: 2nd hand CPU's with monitors, keyboards, mice, server and UPS all new. Mixture works operationally &

financially. Bulk cost is volume of CPUs. The weakness of the model is that when the server dies, everything dies. It is an intense working environment.

- In Namibia have free internet access to empower youth. In that context, solution works well especially in libraries with 5-10 workstations but not as mission-critical as 20-PC lab used for a timetabled programme.
- SchoolNet Namibia would not do an MS solution from a cost & management perspective.
- Major cabling issues – furniture model addresses that.
- 80% of school problems are cable related (ethernet, power, modem)
- In an African context there is little technical knowledge within a school. LTSP – centralised management with computer lab is important. One tier-1 brand, uniformity is important.
- Use LTSP – not necessarily refurbished PCs.
- Within a cluster of schools, leave some spares.
- LTSP is a given and proven solution. Clients: experience with Mecers, Acers as well as Dells, Compaqs. Compaqs not necessarily good, some good successes with Mecers/Acers. Dell P1 standardised.
- Need new keyboards, new mice. The effort to refurb mouse/keyboard not worth it. Order a million keyboards & mice!
- Monitors – trickier to source. SchoolNet Namibia has standardised on Philips 15”
- Computers for Zambian Schools. 160 secondary schools, 10-20 computers. Software: initially 600 Linux Suse copies. Needs 6G h-drive space to install. Stand-alones but if a school can afford cabling, then networked. Basic technical maintenance training – how to change a hard-drive. Preinstall software on hard-drive and send out new hard drive. Also use Windows 95. Learned to keep records of faults.
- In Namibia, the monthly average, between 150 and 300 calls a month on issues related to rogue clients (odd network behaviour).
- Thin-client MS system: need a case study. Does a pure MS remote-booting thin-client system exist ? MS terminal server software not under MS license agreement – license fees apply ? These are questions that need to be explored,
- What about dual systems – OSS server with Windows fat clients.
- The biggest case study: Gauteng online in South Africa – has image-style solutions.
- It is okay if you’ve got a MS system and if you’ve got local support to recover it. In Namibia it is understood that the 14 MS pilot schools, but they are required to phone a call centre in Egypt.
- Linux seem more stable than Windows. Windows 95/98 not supported.
- Linux on 3G h-drive, Pentium II: HP iCommunity, Mandrake 9.1 – haven’t had any problems.
- Fat client – Linux & Windows – in a school environment problems where learners can delete system files. In Linux, root protecting those (security model is better).
- Any solution has to have service support behind it.
- Documentation lacking in OSS solutions – time & effort. Need more small initiatives to add documentation and support.
- What is key therefore are:
    - Support
        - call centre

    - training for teachers
- Removing hard-drives for thin-client network use
    - LTSP examples
    - Unknown whether pure MS remote-booting examples exist
- Certain components new (keyboards, mice, monitors)
- Environmental factors
- Documentation
    - resource materials for technical service centres training course
    - pending
        - TCO study has to to be released
        - bridges.org/SchoolNet Africa research on Software Comparison Study
        - Shuttleworth Foundation
        - Schoolnet Africa Toolkit
- Systematic guide for decision-making
    - get key stakeholders together at one table
    - sort out a national spearhead, and avoid fragmentation

4.3 General Discussion on Campaign Issues

The following points were raised in the general concluding discussion:

- The Campaign should promote the principles of open access, open standards, increased volumes for learners and teachers
- It is envisaged that the Campaign will be run in phases and that the targets set would be for the first two year phase of a five year period.
- The Campaign needs to consider how best it can also become country-based Campaign.
- The Campaign has to focus on the educational outcomes and has to consider inclusion of a networked model as this is the one way in which it will work.
- Perhaps the Campaign should be called "Campaign for 1M Networked PCs…" and should say something about networked education delivery.
- Useful to use connectivity to track usage. Also useful to look at other means to track usage. e.g. in Madagascar, Internet access is unaffordable.
- Consider off-line solutions as well such as supplying CDs for offline content.
- The pedagogical issues on e-learning is more about the learning activities rather than content
- SchoolNet practitioners will have to challenge other players, e.g. telecoms companies, for low-cost Internet access; learners should enjoy the benefits of being online. There should be a campaign for affordable internet access at fixed rates for example US$30/month fixed rate for any school in Africa and challenge telecom operators.
- The Campaign should consider the slogan: 1M Networked PCs for eLearning in Africa

4.4 SNA Draft Position Paper on Refurbished PCs

The workshop agreed not to discuss SNA's draft position paper on refurbished PCs and that SNA should circulate it on the SNA refurb discussion list for comment. The position paper is available in Appendix C.

5. EVALUATION, WAY FORWARD & CONCLUSION

During the course of the two-day workshop, SchoolNet Africa assigned two of its staff to conduct an evaluation of the workshop by asking participants about their views.

5.1 Evaluation

The evaluation revealed that participants in general found the Workshop a very useful networking opportunity and learning experience. The research studies, it was felt, added great value to the quality of the discussions coupled with the generalised experience of the many practitioners working on the ground, attending the workshop. Some participants were concerned that the workshop focused a great deal on the technical aspects and less on the educational issues and asked themselves if this was a workshop for 'techies'. Others found the link to the important educational issues from time to time very useful.

5.2 Way Forward

The next steps after the Workshop involved the following:

- SNA will distribute the position paper for comment to the schoolnet practitioners list as well as the SNA refurb discussion list.
- SNA will work with the African schoolnet practitioners in finalsing an action plan that will involve and draw in the rich international network of groups and organisations present at the workshop. SNA will also consolidate its partnership with GeSCI in particular on this Campaign.
- An African schoolnet practitioners meeting was called immediately after the Workshop.

5.3 Conclusion

In their concluding remarks to the Workshop, Mr Peter Nolan from GeSCI said that the Workshop was extremely informative and valuable and that GeSCI will definitely be discussing ways to consolidate its partnership with SNA on this Campaign.

Ms Heloise Emdon from IDRC said that she has worked with various networks including the health sector networks recently and evidently the education and particular the schools sector network in Africa is indeed very vibrant and in some ways on the leading edge of experience in the use of ICTs. She commended SNA for its leadership role in this process.

APPENDIX A: List of Workshop Participants

Country	Name	Organization
Angola	Ilda Kussumua	SchoolNet Angola
France	Phillipe Mero	Microsoft
Ghana	Clement Somuah	Ministry of Education
Ghana	Edward Tetteh	SchoolNet Ghana
Ireland	Peter Nolan	GESCI
Kenya	Tom Musili	Computers for Schools Kenya
Kenya	Barnabas Sang	Kenyan Ministry
Malawi	Dysan Kaute	SchoolNet Malawi
Mozambique	Kauxique Maganlal	SchoolNet Mozambique
Mozambique	Rogeria Cossa	Ministry of Education
Mozambique	Gilberto Funzamo	SchoolNet Mozambique
Namibia	Joris Komen	SchoolNet Namibia
Namibia	Johan Van Wyk	Ministry of Basic Education,sports and culture
Nigeria	Laolu Sasore	SchoolNet Nigeria
Senegal	Doudou Gaye	GEEP Senegal
South Africa	Shafika Isaacs	SchoolNet Africa
South Africa	Sara Kyofuna	SchoolNet Africa
South Africa	Titi Akinsanmi	SchoolNet Africa
South Africa	Andrea Aranguren	SchoolNet Africa
South Africa	Sikitu Massimango	UN volunteer
South Africa	Ashraf Patel	OSISA
South Africa	Tawandah Mutasah	OSISA
South Africa	Reza Bardien	Microsoft
South Africa	Alfie Hamid	Microsoft
South Africa	Janet Thompson	SchoolNet South Africa
South Africa	Heloise Emdon	IDRC
South Africa	Ilari Patrick Lindy	Embassy of Finland
South Africa	Alistair Otter	OpenResearch
South Africa	Allan finlay	OpenResearch
South Africa	Ian Braid	SchoolNet South Africa
South Africa	Stephen Marquard	Independent Consultant
South Africa	Mathew Chetty	NEPAD eSchools
South Africa	Imraan Jassat	HP
South Africa	Lynnet Chen	HP
South Africa	Hayward Rose	HP
South Africa	Arnold Peterson	CECS
South Africa	Claire Sibthorpe	CATIA
South Africa	Rod Grewan	Digital Partnerships
South Africa	Edward Holcraft	NetDay
South Africa	Denis Branjes	Direque Learn
South Africa	Andy Kiloh	Direque Learn
South Africa	Tsepo Thlaku	Ungana Africa

South Africa	David Nelson	AMD Africa
South Africa	Parthy Chetty	Intel South Africa Corpertion
South Africa	Tim Tucker	CSIR
South Africa	Gerald Roos	Consultant
South Africa	Will Cawood	Solar Engineering Services
South Africa	Hilton Theunissen	Shuttleworth Foundation
South Africa	Anna Batimo	Wits University
South Africa	Lucky Lesego Seepe	Ikamva Le Sizwe Computer Solutions
South Africa	Barron Cox	Cisco
Spain	Estanislao Aguayo	UN volunteer
Sweden	Johan Holmberg	IdealNetworks
Uganda	Allen Luyima	SchoolNet Uganda
Uganda	Humphrey Mukooyo	Senior Information Scientist
UK	Tony Roberts	Computer Aid International
UK	David Sogan	Digital Links
USA	Oso Martin	Free Geek
USA	Bob Hawkins	World Bank
USA	Regina Ryan	World Computer Exchange
Zambia	Payton Sondashi	Computers for Schools Zambia
Zambia	Dr Lemba. Nyirenda	Zambian Task Team
Zimbabwe	Muroro Dziruni	Computers for Africa Zimbabwe

APPENDIX B: Workshop Programme

WEDNESDAY: 13 OCTOBER 2004

Time	*Activity*	*Speaker/s*
9h00 – 9h30	Welcome, Introductions, background and Programme	Peter Nolan, GESCI Ashraf Patel, OSISA Heloise Emdon, IDRC Tom Musilli, CFSK Laolu Sasore on behalf of Eric Yankah, SNA & SNNG **CHAIR:** Shafika Isaacs, SNA
9h30-11h00	Discussion Panel – Research Findings to date : SNA Research CATIA Total Cost of Ownership Study	**FACILITATOR:** Stephen Marquard, Consultant to SNA **PRESENTERS:** Shafika Isaacs & Sara Kyofuna, SNA Alistair Otto & Alan Finlay, OpenResearch **DISCUSSANTS**:Tom Musilli, CFSK Allen Luyima, SNU Muroro Dzurini, CFAZ
11h00 – 11h30	**TEA BREAK**	
11h30 – 13h00	Discussion Panel – Research Findings to date : SchoolNet South Africa Study	**FACILITATOR:** Stephen Marquard **PRESENTERS:** Ian Braid, Consultant to SNSA **DISCUSSANTS:** Gerald Roos, SNSA Janet Thompson, SNSA Edward Holcroft, Netday
13h00– 14h00	**LUNCH**	
14h00 – 15h30	Discussion Panel – Research Findings to date Plenary Discussion: SchoolNet South Africa Study continues	**FACILITATOR:** Stephen Marquard **PRESENTER:** Ian Braid
15h30 – 16h00	**TEA BREAK**	

16h00 – 17h30	Campaign for 1Million PCs	**FACILITATOR:** Stephen Marquard **PRESENTERS**: Shafika Isaacs & Sara Kyofuna, SNA Peter Nolan, GESCI

THURSDAY: 14 OCTOBER 2004

Time	*Activity*	*Speakers*
9h00 -10h30	Group Discussion : Towards an Integrated Strategy on the Campaign for 1Million PCs **Five Groups:** Sourcing the first 200 000 PCs Setting up 10 Technical Service Centres on a Sustainable Model A Capacity Building Plan A Global Partnership Plan Technical Solutions to Using Refurbs Effectively	**FACILITATORS** Johan Holmberg, Ideal Networks Muroro Dziruni, CFAZ Arnold Pietersen, CECS Peter Nolan, GeSCI Stephen Marquard **RAPPORTEURS** Allen Luyima, SNU Laolu Sasore, SNNG Sara Kyofuna, SNA Claire Sibthorpe, CATIA Tshepo Thlaku, Ungana Afrika
10h30 – 10h50	**TEA BREAK**	
11h00 – 13h00	Group Reports and Discussion	**FACILITATOR:** Stephen Marquard **RAPPORTEURS**
13h00 – 14h00	**LUNCH**	
14h00 - 15h30	Plenary Discussion : Towards an Integrated Strategy	**FACILITATOR:** Stephen Marquard
15h30 – 16h00	CONCLUDING REMARKS	Peter Nolan, GESCI Heloise Emdon, IDRC

APPENDIX C:
SNA Position statement on the use of refurbished computers in education

1. SchoolNet Africa Vision and Mission

SchoolNet Africa (SNA) endeavours to improve education access, quality and efficiency through the use of information and communication technologies (ICTs) in African schools. SchoolNet Africa works mainly with learners, teachers, policymakers and practitioners through country-based SchoolNet organisations across Africa.

SchoolNet Africa's vision is for the empowerment of all of Africa's children and youth through access to quality education, information and knowledge on the basis of their effective use of information and communication technologies (ICTs).

SchoolNet Africa's mission is to support national SchoolNets throughout Africa by mobilizing resources, building effective partnerships and knowledge in promoting education through sustainable use of ICTs in African schools.

SchoolNet Africa supports and promotes

- the right of every African child to have access to education, information and knowledge
- affordable and sustainable ICT access for African schools using a variety of solutions
- the creation of locally developed, digitised education content
- expression through the recognition of indigenous African languages
- multi-stakeholder partnerships within a progressive, development framework
- gender integration and women's empowerment
- the achievement of the Education For All objectives and the UN Millennium Development Goals

2. Introduction

The high cost of procuring computers in Africa has led to much attention being focused on the use of second-hand computers for schools. Reusing computers that have been discarded by companies or other large institutions has been seen as attractive for several reasons:

- there is a potentially large supply of computers that are discarded or regarded as obsolete, and
- refurbished second-hand computers can be obtained for a significantly lower cost than new computers.

While the exact scale of the use of refurbished computers is unknown, recent research by SchoolNet Africa suggests that over 20,000 computers have been imported by or supplied to

school networking projects in Africa over the last 6 years.[1] The use of refurbished computers is therefore a significant trend, but equally not yet one that is making a significant impact on meeting the demand for computers in African schools.

On the supply side, indications are that the number of discarded computers potentially available for reuse is in the millions.[2]

However, the effective reuse of computers is not simply a question of matching supply and demand. It is a topic of particular concern and interest because:

- There may be many hidden costs in accepting and using second-hand computers. The true cost is therefore often not known upfront.
- Deploying second-hand computers may impose a significant implementation and support burden on school networks and schools.
- The worst case scenario is one of considerable expense and effort for equipment which may not work reliably or meet the needs of its users.

Using refurbished computers is therefore a strategy which promises high rewards (providing widespread access to computers at low cost), but also carries high risks. SchoolNet Africa therefore believes that decision-makers should examine all aspects of the process carefully before making a decision to deploy refurbished computers.

This position statement is the result of three activities undertaken by SchoolNet Africa:

- A workshop on refurbished computers held at the *ICTs in African Schools Workshop for Practitioners and Policymakers* (Botswana, April 2004)
- A research report commissioned by SchoolNet Africa: *'Treat Refurbs and Africa with Respect': Towards a Framework on Refurbished Computers for African Schools*, published in March 2004.
- An international strategy workshop on the SNA *Campaign for 1 Million PCs for African Schools* held in Johannesburg on13 and 14 October 2004

The statement sets out issues that should be considered when considering or implementing refurbished computers as part of an ICT access programme. It is aimed at decision-makers and implementation agents, governments, Departments of Education, school networks, technical support centres and refurbishing centres.

3. Typical Challenges

The experience of organisations working with refurbished computers in Africa has shown:

[1] See Appendix C, "Treat Refurbs and Africa with Respect: Towards a Framework on Refurbished Computers for African Schools", SchoolNet Africa, March 2004

[2] See for example "Four steps to bridge the digital divide", Robert Davies and Alexsis de Raadt St James, Financial Times, 8 May 2001 (quoted on www.digitalpartnership.org), which estimates that 20 global corporates planned to dispose of over 1 million PCs between 2001 and 2005, and over 600 million PCs would be disposed of in OECD countries in the first half of the decade.

- Transport logistics can be complex – in particular it may be difficult to arrange duty-free import of used computers, and there may be other handling and transport costs.
- Not all donated equipment can be used or refurbished to an acceptable quality. There may also be compatibility problems with older hardware and newer peripherals.
- Batches of donated equipment may include many different hardware types. Heterogeneous collections of equipment can cause compatibility problems and substantially increase deployment and support costs.
- Refurbished computers may have higher maintenance and support costs, owing to the age of the equipment and higher failure rates.
- Depending on how refurbished computers are used (stand-alone or networked, fat- or thin-client), there may be restrictions as to what software can be run on them.
- Environmental considerations must be taken into account when disposing of unwanted second-hand computers, or refurbished computers at the end of their useful life. Computer components contain toxic materials that should be disposed of responsibly.

Projects that envisage using refurbished computers should therefore consider all of these challenges carefully, and adopt appropriate processes and strategies to address them.

4. Deciding Whether of Not to Use Refurbished PCs

The following areas should be considered when deciding whether to accept a donation of second-hand computers, or use refurbished computers in an ICT rollout project.

4.1 Fitness for Purpose

The ability of refurbished computers to meet the computing needs of the school or end-users should be assessed. Requirements could include an Office suite (word processor, spreadsheet, etc.), Internet access (web browser and email client), multimedia applications (for example an encyclopaedia on CD with sound and video clips) and educational software.

The ability of a computer to run software or a particular operating system depends on processor speed, available memory, hard disk space and hardware specifications. Refurbished computers may meet some but not all computing needs.

In some cases it is possible to increase the usefulness of refurbished computers by using them on a network, and in other cases it may be possible to meet schools' overall computing needs by a mixture of refurbished and new computers.

4.2 Total Cost of Ownership

Total Cost of Ownership (TCO) refers to the overall costs of using a particular technology solution over its expected lifetime, including:

- Initial purchase
- Installation
- Training

- Maintenance and Support
- Disposal

To assess whether refurbished computers are actually cheaper than new equivalents, it is necessary to compare the total cost of ownership of new vs refurbished solutions in a given context.

It should be kept in mind that the factors influencing total cost of ownership vary widely across different contexts and countries, so it is not always possible to draw general conclusions from cost of ownership figures.

4.3 Integrated Strategy

Deployment of refurbished computers is more likely to be successful when there is an integrated strategy which addresses all stages of the pipeline, viz.

- Donation and/or procurement of second-hand PCs
- Refurbishment of second-hand PCs
- Distribution and installation of refurbished PCs
- Maintenance and use of refurbished PCs
- Disposal at end-of-life of refurbished PCs

If a particular element is missing (for example there is no effective maintenance or support system), then the entire implementation may be ineffective. An appropriate technical design which takes into account the capabilities of the refurbished computers is particularly important.

4.4 Absorption Capacity

The volumes of refurbished computers that can be accommodated in a project are determined by the capacity of each stage of the pipeline. As there is a large demand for computers from schools, and a potentially large supply of second-hand computers, the capacity of refurbishment centres and availability of technical support are likely to be constraints.

5. Recommendations

5.1 Policy

Where educational technology policy at national or local level deals with refurbished computers, it should:

- Require organisations donating or implementing refurbished computers to assess all of the relevant costs in the process, avoiding hidden or deferred costs.
- Emphasise an integrated deployment process, including strategies for maintenance and technical support.
- Require an environmental impact assessment and eventual disposal plan for any rollout of large numbers of computers.

5.2Donors

Donors supporting the deployment of computers in schools should consider the end-to-end process, and consider committing financial and technical resources beyond simply supplying PCs to schools, to ensure that donated PCs are:

- installed in good working order,
- appropriately maintained, and
- disposed of responsibly at the end of their life.

5.3 Schoolnets and implementing agencies

Schoolnets and implementing agencies should:

- Develop an appropriate technical design for using refurbished computers. This should include:
    - How the computers will be used in schools (stand-alone or networked; if so, thin-client or fat-client)
    - What operating system and hardware the computers will run
    - How the software will be preinstalled and configured
    - Addressing any relevant licensing issues to ensure that installed software is legal.

- Develop support and maintenance strategies and systems. This could include:
    - Establishing technical support centres
    - Providing telephonic and email support.
    - Keeping a central stock of spare refurbished computers that can be used to replace failing computers.
    - Providing each school with spare refurbished computers, so that failing units can be swapped out onsite.

- Put in place appropriate procurement systems and standards, based on the technical design for the use of the computers. This should include:
    - minimum hardware specifications,
    - requirements for uniformity of equipment (for example whether all components should be of the same make)
    - standards for aesthetics and appearance of equipment.

- Procurement standards should be applied regardless of whether equipment is purchased or donated, as unsuitable donated equipment creates a further disposal problem.

- Establish a mechanism for end-of-life computers to be disposed of in an environmentally responsible manner, and ensure that any costs relating to this are covered in some way.

5.4 Users

End-users who are recipients of refurbished computers should:

- Understand the cost/benefit tradeoff to using refurbished computers rather than new computers
- Understand the abilities and limitations of the computers (for example what range of software should the computer be able to run)
- Establish what support mechanisms are available should the hardware fail.
- Ensure that end-of-life computers are disposed of in an environmentally responsible way (for example by returning them to a recycling centre).

6. SchoolNet Africa's Programme of Activities

6.1 Research and Information Sharing

SchoolNet Africa believes that targetted research and information sharing is important in supporting informed decision-making and effective ICT rollouts. SchoolNet Africa's Knowledge Warehouse includes information and resources on refurbished computers at:

http://www.schoolnetafrica.net/1304.0.html

Organisations using or researching refurbished computers are encouraged to share experiences and information with SchoolNet Africa and other Schoolnet practitioners.

6.2 Campaign for One Million PCs for African Schools

SchoolNet Africa has launched a Campaign for One Million Computers for African Schools. The first phase of this campaign is to build capacity in technical service centres for refurbishing computers and providing technical support.

For more information, see http://www.schoolnetafrica.net/1325.0.html