FINANCING ICT IN TRANSITIONAL ECONOMIES & DEVELOPING COUNTRIES

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WHAT DO WE KNOW ALREADY ABOUT THE COSTS OF ICT IN BASIC EDUCATION?

- **The information that follows is drawn from *"Knowledge Maps: ICT in Education – What do we Know about the Effective Uses of ICT in Education in Developing Countries"* (2005) published by *info*Dev and based on a review of existing research into all aspects of ICT usage in developing countries**

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COST IMPLICATIONS

- Little is known about the true costs of ICT in Education in developing and transitional economies. Neither donor projects nor government computerization programs have a good track record in identifying the TCOs
- Little research has been done on Cost Effectiveness
- Little research so far on the Opportunity Costs of ICT in education

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COMPONENTS OF THE TCO

- Initial hardware investments generally projected with reasonable accuracy, although relationship between initial costs and total costs (10-25%) not often established
- Replacement costs often not considered
- Recurrent Costs often ignored
- Associated costs usually ignored or under-estimated
- Different costs have different profiles (e.g., unit cost of hardware tends to decrease although actual costs can increase; software is often only a small cost component, although can be higher where software development in a number of LOIs is involved; power and connectivity costs vary widely; TT and maintenance costs tend not to decrease)

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STRATEGY ISSUES - 1

- Strong political will to introduce ICTs into basic education. Decisions are often taken at very senior levels of government and tend also to be strongly hardware led
- Being able to announce that there are computers in all schools is frequently more important than how (or even whether) they are used

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STRATEGY ISSUES - 2

- Some evidence suggests that ICT for admin and management (increased system efficiency) is likely to be more effective initially than classroom use
- General view in developing countries that ICTs are more important for secondary and tertiary sectors than for primary
- Some research suggests that computers in libraries, TT, and community telecentres are more cost effective than computers in school labs (this view is supported by outcomes from RETA school surveys)
- Donated hardware may be more expensive operationally and less cost effective than new
- Research suggests that PCs are around 10 times more expensive than School TV

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RESULTS FROM THE RETA

- **In general, the conclusions of the Knowledge Map on Costs have been confirmed by the RETA country reports.**
- **What follows are the conclusions from the RETA research on ICT costs**

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SOURCES OF FINANCING

- **Governments and Development partners tend to be the main source of capital investment in hardware and the refurbishment and upgrading of premises – although often the target hardware life and the costs of replacement are not identified - or even who will fund the replacement costs**
- **In Central Asia, governments are the normal funders of utilities (phone and power) but the impact of ICT on these costs is rarely calculated**
- **Governments are generally responsible for associated costs such as curriculum and assessment reform but PPPs can contribute to the costs of teacher training**
- **Parents tend to be the source of most of the recurrent cost burden comprising ISP costs, maintenance, consumables and sometimes even power supply where local funds are insufficient. There are many relatively small NGO or donor funded projects supporting the extension of connectivity, particularly in rural and/or remote areas**

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TCO CATEGORIES - 1

1. Capital Investment Costs
   - Classroom refurbishment and furniture
   - PCs and Cabling (thin client widely rejected; green computers unknown in CAR
   - Peripherals (vary greatly)
   - Replacement Costs (target life not often specified so provision for replacement rarely budgeted)

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TCO CATEGORIES - 2

2. Recurrent Operational Costs
   - Power Supply (often unreliable in rural or remote areas)
   - Internet connection charges (vary widely)
   - Line Charges (vary widely)
   - Maintenance and Technical/Professional Support (often not available outside main urban centres)
   - Consumables
   - Licenses (Can be centrally negotiated and paid at special rates, or ignored, or a mixture of both depending upon the source of funds)

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TCO CATEGORIES - 3

3. Associated Costs (usually recurrent but variable)

- Software Development & Provision (particular issue for national languages where there is little education material on the web and for countries with multiple languages of instruction e.g.,Uzbekistan with 7 LOIs)
- Teacher Training (PRESETT & INSETT)
- Supervision, Monitoring & Evaluation Curriculum Reform
- Assessment Reform
- Professional Support Services

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RETA FINDINGS

- **5 out of 6 RETA countries had no idea about the true costs of introducing ICT into basic education**
- **None of the countries had made financial projections or provision to cover replacement costs**
- **None of the countries had made provision for operational recurrent costs**
- **Costs associated with ICT (e.g., Teacher Training) had been seriously under-estimated or not estimated at all**
- **From our review of other ICT development projects in other countries the situation described above seems to be quite widely typical**

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POWER COSTS

- A standard PC utilises around 300 watts
- On the assumption that the PC will be used 8 hours per day, 5 days per week, 34 weeks per year it will utilise 408,000 kWh per year
- At a cost of US$0.06 per kWh this is US$244.80 per PC in power costs
- With a computer lab of 10 computers this is close to US$2,500 per year per school

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"GREEN COMPUTERS"

- **The new generation of energy efficient computers use between 60-85% less energy than standard PCs of the same operational characteristics and are around US$80-100 more expensive to purchase**
- **The additional purchase costs could be recouped in lower energy costs in the first year of use**
- **None of the RETA countries had purchased or tested any green computers.**
- **This also seems to be widely typical of other school-based ICT developments in the region and beyond.**
- **Bearing in mind the more or less severe resource constraints in a majority of transitional and developing countries this is an issue of concern**

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CONNECTIVITY COSTS

- **These vary greatly according to the type of connection (e.g., dial-up, cable, satellite, leased line, ADSL etc)**
- **In Uzbekistan broadband connections provided via wireless connections cost:**
- **Terminal – US$250**
- **Antenna – US$20**
- **Line charge – US$20 per month**
- **ISP subscription – US$60-100 per month depending on data transfer rates and traffic limits**
- **Thus, a school broadband link would have an installation cost of US$270 and annual charges amounting to US$960 to US$1,440.00 per year**
- **At present, few schools could afford these costs without parental support**

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OTHER RECURRENT COSTS

- The IREX Connectivity Project in Uzbekistan provided detailed estimates for average maintenance and consumables costs as follows (based on a school set-up of 10+1 PCs)
- Maintenance and Servicing – US$35 per month (US$420 p.a.)
- Consumables – US$30 per month (US$360 p.a.)
- Maintenance varies greatly in cost, quality of service and speed of response between urban, rural and remote areas. In many places it is simply not available at all

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RECURRENT COST SUMMARY

- Assuming a 10+1 school set-up an "average" recurrent operational cost for a school lab could be:
- Power – US$2,500 p.a. (but reducible by up to 85% with green computers)
- Connectivity – US$1,200 p.a.
- Maintenance – US$420.00 p.a.
- Consumables – US$360.00 p.a.
- TOTAL ANNUAL COST = US$4,480.00

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ASSOCIATED COSTS

- These include:
- TEACHER TRAINING (PRESET & INSET)
- MONITORING AND SUPERVISION
- e-MATERIALS DEVELOPMENT (these can be high when multiple local languages are involved as LOIs)
- CURRICULUM REFORM
- ASSESSMENT REFORM

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OVERALL IMPACT

- A research study in one Central Asian country suggested that a computer to student ratio of 1:50 would increase the annual non-salary recurrent educational budget by a minimum of 65%
- Because recurrent and associated costs have not been calculated, projected and provided there is widespread under-use, mis-use and non-use of the expensive hardware provided
- A recent school survey in Azerbaijan has produced disturbing data on these issues

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CONCLUSIONS

- ICT Development strategies must calculate the TCO for the ICT vision to include investment costs, replacement rates and costs, recurrent costs and associated costs
- Recurrent and associated cost budgets determine the extent and the manner in which ICT hardware will be used in schools and whether it will be cost effective in terms of student outcomes
- Cost reduction strategies must be considered, tested and implemented (e.g., energy efficient technologies) wherever possible
- **The RETA is attempting to develop integrated TCO spreadsheets to support the process of full cost identification**

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