Thematic brief

ICTs in Education: Some practical lessons learned

May 2008

Numerous attempts to introduce ICT into the education sector have been carried sometimes with good results but also with some less successful outcomes. Documenting lessons learned during the process minimizes the risk of failure and maximizes the chances of success. The lessons described here are based on the experiences of local partners of the International Institute for Communication and Development (IICD) from nine developing countries: Bolivia, Jamaica, Uganda, Burkina Faso, Mali, Zambia, Tanzania, Ghana. Over a period of 8 years they developed and implemented 32 ICT for education (ICT4E) projects for primary and secondary schools, teacher training colleges, universities, and vocational training centres for young people. The key lessons they learned during this process are summed up below.

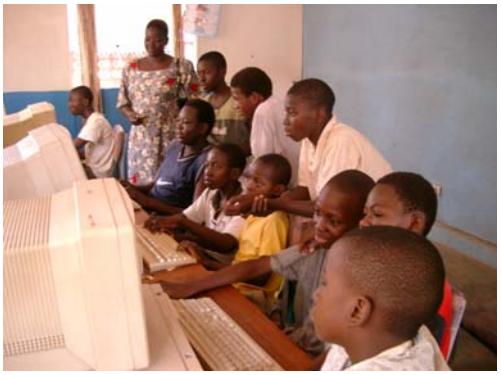
Teaching and learning processes

Focus on materials developed by teachers and instructors

This ensures ownership by teachers and instructors and enhances the usability of products. Many projects still focus on using materials that have been developed externally. However, these materials often fail to provide appropriate content for the local situation.

Include teachers in discussions about using external materials

Developing local content takes time. External content can therefore be used in the meantime to complement local materials. This will ensure that teachers have access to enough materials for the different subjects. However, include teachers in all discussions about using external materials and allow for possible modifications.



Select content areas on the basis of needs and priorities

Educational organisations need to make smart choices about the courses that best suit their own needs and where ICT applications can add the most value. This will help to manage expectations and channel efforts in the right direction. Avoid making ambitious plans to completely digitise all the content in every subject area - developing materials using ICT is highly complex and time-consuming: start small.

Match ICT training given in schools with the demands of the work force

Before providing specific ICT training to young people, it is important to examine the requirements and needs of the government or the private sector first. It is only then that graduates will be able to increase their job opportunities. Matching offer and demand is crucial: this is true not only for the requirements needed today but also for the skills that will be required tomorrow.

Train teachers and instructors in basic ICT and pedagogical skills

Teachers and instructors need to be trained in basic ICT skills and ICT-based teaching methods so that they feel comfortable about using the materials. With the odd exception, on the whole, teachers are generally afraid of ICTs. It is equally important to train them to integrate ICT in their teaching methods. Ensure, therefore, that people can apply their knowledge immediately after training. All too often, teachers or other officials receive training but cannot, or will not, use the skills once they have obtained them.

Help teachers to network with each other

Help teachers to set up discussion platforms that will enable them to share their opinions, experiences, and materials with fellow-teachers. Face-to-face and virtual meetings are important, both to motivate teachers and to improve the quality of local materials. They allow teachers to develop their own networks. These mechanisms are vital to ensure that teachers remain motivated, to apply lessons learned, and to share knowledge and experiences between teachers at the national and international level.

Use administrative applications as complementary services

More effective and efficient administration and management information will help to motivate headmasters and administrative staff to institutionalise the use of ICT across the board in all educational institutions. While most beneficiaries view using ICTs for teaching and learning purposes as a priority, using ICT to support the management and administrative procedures within a school is also very important. Training should therefore be given to the school's management and administrative staff in schools, not only the teachers and pupils. That way, ICT will become an integral part of a school's administrative procedure.

Technology

Increase access to computers

Any initiative, be it government, NGO or private sector-based, should place 'lobbying for more investments in computers' high on its agenda. Most teachers, instructors and students indicated that the main obstacle blocking the effective use of ICT in educational programmes was the lack of sufficient access to computers. This is even more relevant for educational institutions in rural areas where the school or training institution is often the only access point to computers. While this requires a massive investment in infrastructure, it is essential to guarantee more equal access and to overcome the digital divide.

Introduce combined off-line and online-based applications

Access to the Internet is an important tool for education as it provides easier access to online teaching and learning resources. It can also be used to help teachers and students network with each other and to share administrative and management information. Internet access is therefore recommended if low-cost, satisfactory services can be provided. However, in many areas Internet is still either unavailable or very costly. In these cases, other tools for exchanging information - such as CD-ROMS – should be integrated at the beginning of the project. Try to find partners nearby during the early stages of the project who have the necessary ICT infrastructure so that the content can be used in a meaningful way.

Search for low-cost, simple solutions

Even where computers and Internet access are available and affordable, do not develop or introduce expensive online education platforms that require high-bandwidth Internet access. The broad availability of free and open access platforms strongly increases the feasibility of a dynamic virtual exchange of experiences, opinions and materials. Be aware that students and teachers often have very different perceptions about which technologies are desirable, appropriate and necessary, and which are not. Even a basic email list can be very effective in terms of networking and keeping teachers and students motivated.

Consider using second-hand computers

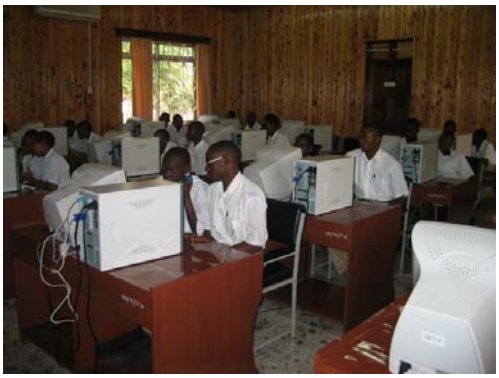
Low-cost, simple solutions that serve a larger number of teachers and students are crucial. Second-hand computers are offered free-of-charge or at a very low cost by various private sector and not-for-profit initiatives. However, second-hand computers usually come with additional costs for repairs, import taxes and costs to replace missing parts. Alternatives are found in the low-cost PCs such as the 100$ computer and similar initiatives by the private sector. Lobbying for lower or zero taxes on imports of ICT is another way of reducing costs for the education sector.

Consider using Open Source Software (OSS)

Many discussions have taken place in recent years concerning the use of Open Source Software (OSS) versus proprietary software, but clear-cut answers remain elusive. It is important to consider the philosophy as well as the level of convenience and related costs.

Work out the Total Cost of Ownership beforehand

To assist in decision-making for different technology solutions, it is recommended to calculate the Total Cost of Ownership which not only incorporates the initial investment but also training and maintenance costs such



as those developed by the Global E-schools Initiative (www.gesci.org).

Sustainability

Set up a 'committee' to manage the ICT facilities

Strategically involving headmasters and parents is necessary for the institutionalisation and longer-term sustainability management of ICT facilities. Setting up 'Administrative Committees' to manage ICT facilities is an effective way of ensuring the sustainability of ICT initiatives.

Encourage masses of people to use ICT

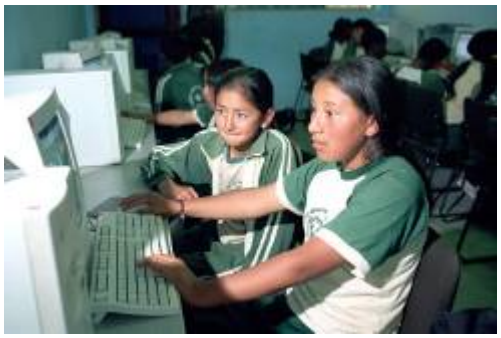
While in many cases access to ICT is limited to a small group of interested teachers and students, participation of a larger group of administrative staff, teachers and students in projects is crucial to ensure the widespread institutionalisation and integration of ICT in educational institutions.

Win the support of the local authorities

Beyond the institution, it is important to seek political support from local authorities and district or national education authorities to prepare for longer-term opportunities related to funding and recognizing ICT as part of the curriculum.

Develop a well-considered financial plan

Before you even begin, develop a well-considered financial plan. Start by choosing the ICT applications that can be sustained by the budget of the school or college in question. External funding can finance initial one-off investments such as infrastructure. However, the institutions themselves must be able to pay for recurrent costs such as the salaries of the ICT manager or teachers, office costs, Internet service costs, and maintenance.



Private training institutions may be able to generate sufficient income from trainees to be able to invest in more advanced ICTs. However, larger state-owned teacher training colleges and training institutes need to guard against making rash judgements about the potential revenue they can bring in from ICT and related training. These institutions define how much of the institutional budget can be reserved for the recurrent costs of ICT and take this as a starting point for an ICT plan.

Smaller rural schools or vocational training centres will not be able to sustain costly ICT applications and should avoid high recurrent costs right from the start. However, we have also seen that smaller institutions are able to sustain smaller computer labs. Contributions made to the school by the Parent-Teacher Associations can also go a long way towards supporting ICT projects. It is often the case that once a small computer lab has been installed for the children, smaller contributions can sustain recurring costs as well as investments in new or additional computers.

Secure technical capacities at the institutional level

ICT managers in the participating institutions need to be sufficiently trained to ensure that they can maintain and upgrade the ICT facilities on their own without any outside help. As it is hard to keep hold of ICT-trained managers, institutions need to train a core group of interested teachers and students as well ensuring that temporary replacements are available if needed.

Retrain staff regularly

Different skills are required to train staff and teachers and to maintain ICT at the national, district and local (school) level. A network of skilled individuals needs to be in place in order for each person to assist and share new skills. As the ICT sector is constantly changing, staff members will need to be retrained regularly and have their existing skills upgraded**.**

Policy development

Generate awareness based on first-hand experiences

It is important to promote and facilitate awareness and lobby activities by practitioners by using real-life stories about how ICTs are making a difference in the education sector. Despite the enormous progress made during the last decade, policymakers are still generally unaware about ICT, particularly about aspects of ICT for development (ICT4D) within the education sector. Often, people only associate ICT with an ICT infrastructure and an ICT literate workforce. Other aspects such

as rural access, capacity development, and the use of ICT in the curriculum, need to be addressed. For many of IICD's project partners on the ground, the lack of interest and recognition from the government was found to be a strong de-motivating factor.

Field visits from policymakers and presentations by teachers

Field visits made by policymakers to local projects and presentations by headmasters and teachers who are actively involved in a project have been proven to be effective. Support from external supporting institutions was found to be important as a complementary instrument in awareness raising and lobbying.

Participate in education ICT policy and strategy development

A long-term vision with regard to integrating ICT in education is needed to provide guidance and motivation to enthusiastic early adopters and other stakeholders. A vision is also crucial to deploy ICT effectively throughout the sector.

Involve government

In the longer term, active participation by government is essential to ensure the sector-wide introduction of ICT in education. Government involvement is critical to source additional investments in the ICT infrastructure; to integrate ICT in the curriculum; and to facilitate the widespread diffusion of materials.

Define areas of responsibility: who does what

A frequent drawback during the initial stages of formulating an ICT policy is that there are often no clear lines of responsibility for ICT at the different ministerial levels. Therefore, it is important to set up a clear organisational structure for ICT to galvanise

the formulation process and, eventually, the implementation process.

Train ministry staff to use ICT

It is equally important to train Ministry staff, both at the decision-making level and the technical level, in order to inculcate sufficient understanding of the possibilities and limitations of ICT for education. The strategy has to be integrated in the Ministry's overall short-term and long-term education objectives, therefore a link must be made between the decision-makers and the technical staff as well.

Lobby for a participatory policy-making process

A participatory policy-making process involving discussions and reflections by various stakeholders will ensure that governments take on board the needs of

private sector partners and educational institutions at local level. Local educational institutions with ICT experience in the sector can also assist in the ICT formulation and implementation processes. This will enable successful projects in the sector to find recognition for their efforts. It also creates a win –win situation where the government gains access to on-the-ground experiences and lessons learned and project partners in turn have the possibility to access additional funding opportunities.

Support the certification of educational materials

National governments or a recognised educational body should certify new ICT-based materials in the sector. This process can prove to be rather challenging and time-consuming. However, certification can be helpful if an institute is planning to request financial support from the government to help it produce more materials and distribute them more widely, for example. If it proves difficult to obtain certification, try to use the materials as extra-curricular materials or lobby the headmaster and the Parent-Teacher Association for support.

Monitoring and evaluation (M&E)

Set up an M&E approach before you start

It is essential to introduce a monitoring and evaluation approach for projects right from the start to facilitate learning, particularly during the implementation process. IICD's participatory and learning-based M&E system is a good example of how this can be done in practice.

Find ways to increase peer-to-peer learning

Networking between projects at the country level is very valuable. For this, the national ICT for development networks supported by IICD provide a possible approach. Cross-country exchanges are also important to motivate and promote the exchange of experiences with regard to ICT for education (ICT4E) projects and programmes. This can be accomplished through South-South Learning Exchanges, such as those set up by IICD and HIVOS, as well as international conferences, particularly the E-learning conferences. For more sustained learning, online communities of practice for practitioners, such as those facilitated by dgroups (www.dgroups.org), can be an additional option.

The impact on the Millennium Development Goals (MDGs) and the Education for All (EFA) initiative

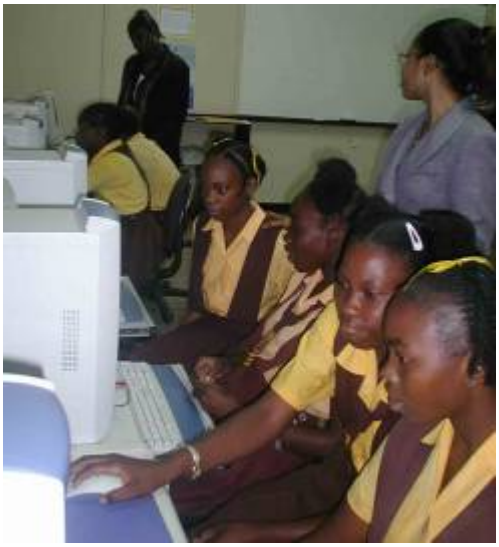
ICT supports universal access to education - MDG 2 and EFA

ICT projects can make a positive contribution towards achieving universal access to education. This is the result of the tangible satisfaction and impact of ICT on the quality and efficiency of teaching and learning processes at primary, secondary, tertiary and teacher training levels. Evidence gathered by IICD from 32 ICT4E projects showed that up to 80% of those taking part in the projects were more aware of the benefits of ICT and felt empowered. Sixty percent of the

participants said that they had experienced a direct improvement in the teaching and learning processes. One important detail that emerged during the course of analysing this data was that both teachers and students indicated that ICT can bring inspiration and fun back to the teaching and learning processes in the classroom as well as the training room.

ICT can generate opportunities for adolescents entering the work place- MDG 8

The way in which ICT is applied in the study contributes to the generation of skills that will prepare young people, entrepreneurs and workers for employment opportunities in the 21st century. This was found to be the case with the vocational training projects that trained people to perform specific technical jobs. Equally, the training institutions described in the study directly contribute to the preparation of knowledge workers with specific ICT skills. In 2007, 75% of the participants indicated that they had experienced an improvement in their employment opportunities.



Equal gender opportunities - MDG 3

Forty-five percent of those taking part in the ICT4E projects supported by IICD were women, indicating a healthy gender balance. Yet, despite the equal participation of women, a lower impact level was still recorded for this group of end-users. As there is no clear explanation for these observations, this issue is now being studied in more detail by IICD and its local partners.