Learning Report

iicd
People - ICT - Development

ICT for education: five years of learning

CONTENT

INTRODUCTION

The use of information and communication technology (ICT) can significantly improve the chances for children to receive universal access to education (Millenium Development Goal number 2), but can also contribute to a higher quality of education and better school management. A geography teacher with access to appropriate learning tools and a student who finds a better job thanks to newly acquired computer skills are just two examples of the results of IICD's work in education. Using ICT to improve education has been an IICD priority since its establishment in 1996.

Over the years, IICD has worked with education partners in 12 developing countries, supporting 71 projects in Africa and Latin America. Our aim is to use ICT to bring about sector-wide improvements in education. IICD is unique in that it works at both the grassroots and the policy level. Our partners and portfolio of projects span primary, secondary and vocational education, as well as national education ministries.

This publication provides a selection of lessons learned in the five educational services that IICD provides.[1]

Education in developing countries today

Globally, some 61 million primary school-aged children do not attend school, and about 17 per cent of adults are illiterate. This amounts to 775 million people, two-thirds of whom are women. The latest figures from sub-Saharan Africa show the number of children not in school has increased by 1.6 million between 2008 and 2010 . Compounding the problem, more than 2 million additional teachers will be needed in sub-Saharan Africa alone to realise the goal of universal primary education by 2015.[2]

Enabling children to attend school is only part of the solution. Once in school, students need an environment conducive to learning. They need qualified, motivated teachers and access to appropriate, culturally relevant learning materials. In practice, however, those fortunate enough to go to school often face overcrowded classrooms, often with limited facilities (water, sanitation), shortened school days to accommodate all of the enrolled students, lack of textbooks and antiquated curricula.

What ICT can do

ICT offers answers to many of these challenges. ICT can help improve the quality of education and access to it, especially in remote areas. Digital learning materials and ICT-assisted teaching methods can be created, accessed and shared among teachers and students alike. This strengthens curricula while also fostering an inspiring working and learning environment. ICT tools can improve school management and administration as well, enabling headmasters to track personnel and expenditures and more closely monitor student performance. Policymakers can draw on these experiences for national strategies on integrating ICT into education more broadly.

IICD's social innovation approach

IICD has developed a unique approach to strengthen public services in developing countries. We call this our 'ICT-led social innovation process'.[3] In education, such a process brings together a range of stakeholders to set priorities for improvements. Together, stakeholders design how their organisations could use ICT to empower staff and students to raise the quality and relevance of education. IICD regards ICT not as a goal in itself, but as a tool for people to use to shape their own development.

While many ICT-oriented development programmes focus on the transfer of a specific new or innovative technology to a developing country, IICD takes a different approach.

We recognise that projects have to be driven by users' needs, and they must fit the local context. We therefore employ a participatory, multi-stakeholder approach to address structural problems. Our work in education involves government representatives, school administrators and managers, teachers, parents and local communities in project formulation. Moreover, all projects pay special attention to supporting teachers in their essential role as mentor to their students.

A first step in the IICD approach is to map the current situation, identifying needs, challenges and actors within a sector and country. Building blocks of this **needs assessment** phase are the problem analysis, target group consultations and a roundtable workshop to assist partners in identifying possible projects.
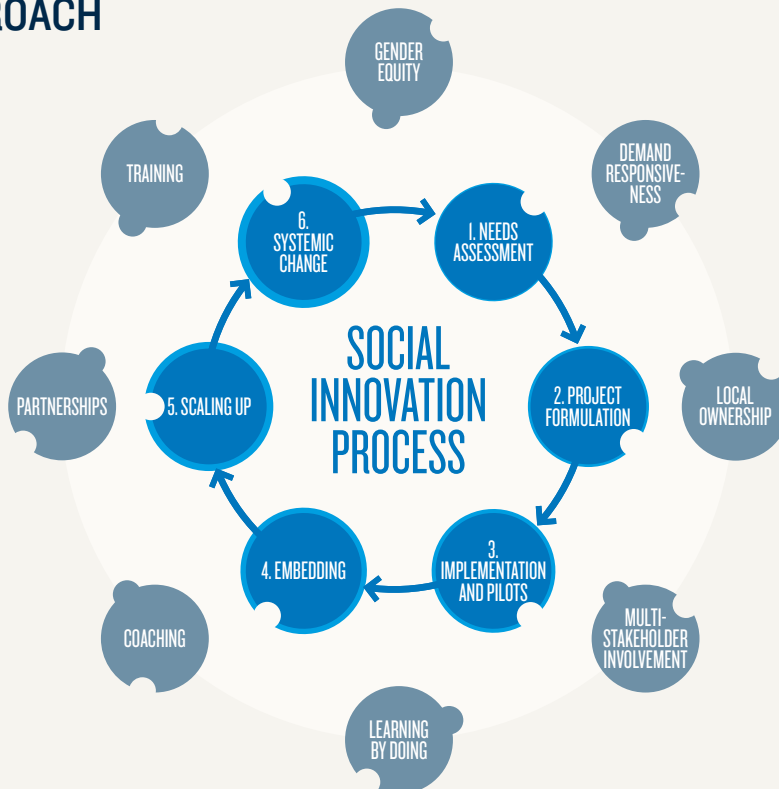
The second phase is **project formulation**. Stakeholders evaluate technological solutions and ICT competences during what we call a 'solution design workshop'. IICD combines these workshops with one-to-one coaching and advice on strategic, technical and financial aspects of project proposals. We also offer advice on alignment and integration of ICT within our partners' institutions and more widely.

Once project proposals are finalised and approved, our partners take full ownership of the initiatives and activities. Project operation, strategic development and management are squarely in their hands. Most projects start with a **piloting** phase in which partners test their ideas with basic prototypes and trial runs before scaling up to broader implementation.

Based on lessons learned during the pliot phase, IICD supports partners in further integrating and rolling out ICT in their programmes. It is in this phase that local organisations start to fully use and understand the potential of ICT for accomplishing their development goals. In this **embedding phase**, IICD support takes a more strategic turn, focusing on change management, knowledge sharing and lobbying.
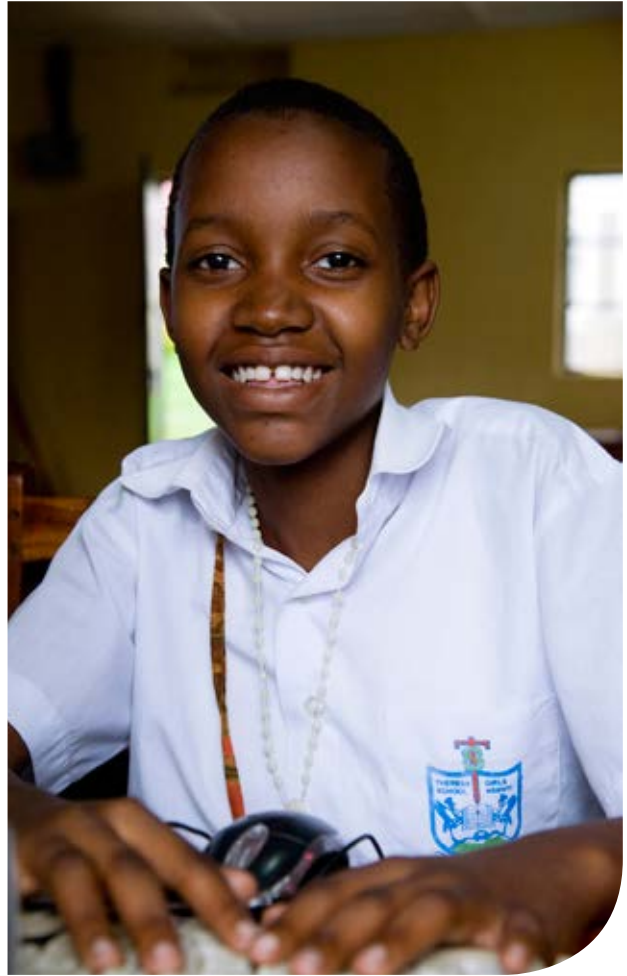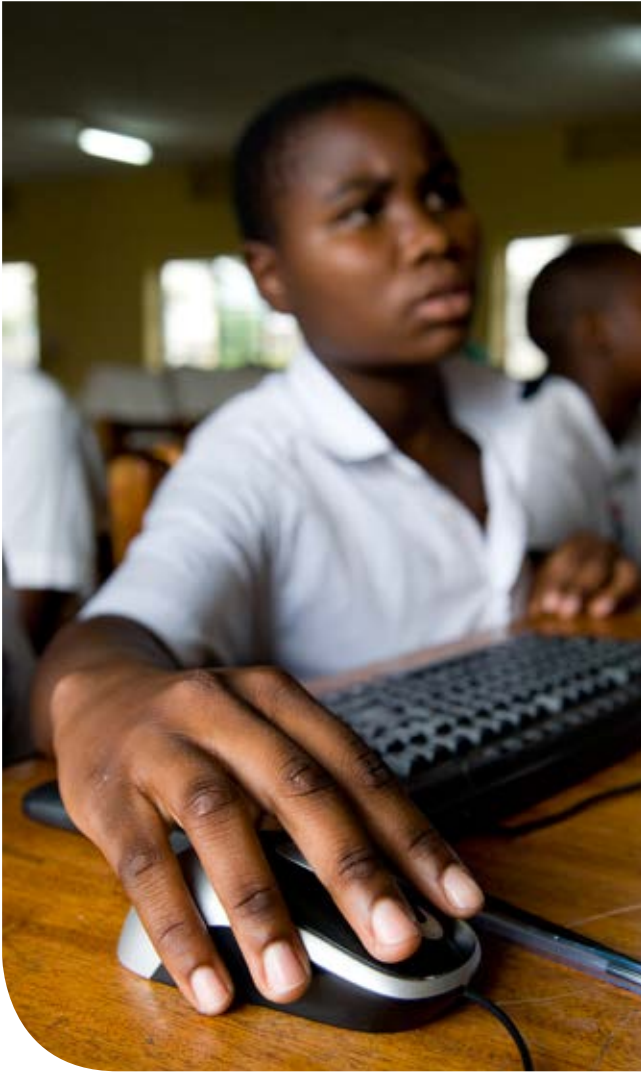
Once a sector programme has reached completion, IICD continues to be available in the role of adviser and broker, for further expansion and scaling up of ICT within the sector. Consolidating and building on our own and our partners' experiences and input, we work with governments, donors and NGOs to develop and implement national strategies and policies and large-scale ICT for Development projects and programmes.

FROM NEED TO SUSTAINABILITY
THE IICD APPROACH

90%
OF OUR PROJECT PARTNERS ARE HIGHLY SATISFIED WITH OUR APPROACH

→ PROCES STAGE

GUIDING PRINCIPLES

SOCIAL INNOVATION PROCESS

GENDER EQUITY
TRAINING
DEMAND RESPONSIVE-NESS
PARTNERSHIPS
LOCAL OWNERSHIP
COACHING
MULTI-STAKEHOLDER INVOLVEMENT
LEARNING BY DOING

1. NEEDS ASSESSMENT
2. PROJECT FORMULATION
3. IMPLEMENTATION AND PILOTS
4. EMBEDDING
5. SCALING UP
6. SYSTEMIC CHANGE

CASE RAISING AWARENESS OF THE POTENTIAL OF ICT FOR EDUCATION

Raising awareness of ICT's value in the classroom remains a key first step when introducing ICT in education. School administrators, teachers and parents need to be included in the project formulation process from the beginning. This increases their understanding of what ICT can and cannot do, and stimulates maximum uptake of ICT at all levels. School administrators in the Zambian ENEDCO project played a major role in spreading the benefits of computer literacy in their schools. Once they learned of the potential benefits of ICT, they made computer use by teachers mandatory. Teachers quickly developed basic ICT skills, once they were no longer allowed to ask school secretaries for assistance in their computer-related tasks.

1. CREATING AND UPGRADING EDUCATIONAL MATERIALS

Many of our partner countries lack access to culturally relevant teaching materials. Especially in rural areas, most of the textbooks that are available have been developed abroad without any adaptation to the local situation. This makes it hard for students to understand the content and relate to it. Sometimes parents may doubt the value of sending their children to school, since the skills and knowledge they bring home seem to have little relevance to their daily lives.

A primary IICD focus is training teachers to develop their own learning tools using ICT. This approach ensures local ownership and more relevant and usable materials. Alongside teachers' own self-developed materials, there is a growing online availability of learning tools, including books, videos and games. These too can be used to boost motivation and skills, not only of students but of teachers as well. In a project supported by IICD and its local partner EDUCATIC Bolivia, the use of educational computer games in schools led to an increase in school attendance. This is a strong indicator of the potential of ICT, in particular, interactive digital tools, to increase student performance. They are a valuable complement to traditional teaching methods.[4]

Support for interactive and student-centred pedagogy

Teaching teachers how to create their own digital learning tools has another important benefit. It increases teachers' pedagogical competences. This ultimately leads to better student performance. Furthermore, use of ICT can stimulate a transition from classical teaching methods, where teachers are senders and students are passive receivers of knowledge, towards a more interactive learning environment in which both teachers and students are proactive knowledge creators.

An IICD-supported education project in collaboration with Computers for Schools in Uganda has shown that such a transition takes time and requires a two-pronged approach. Teachers need training in ICT and content development, as well as in new, more student-centred approaches to learning.

Another way to create an interactive learning environment is to teach students to create digital content. Ugandan students have developed collaborative projects in which they research a social issue and present their findings in class using Power-Point. The presentations are then packaged on CDs for sharing among schools. The aim here is active engagement of students in their education, which reduces dropout rates as well. In a project in collaboration with Peruvian educational organisation TAREA, video materials that were produced by school children had the additional benefit of capturing the children's culture visually and helping to preserve their local language.

Digital games that fit the local context

Educational computer games are a great way to get students attention. Many such games are available online, so it is not necessary for schools to reinvent them. However, it is important for teachers to know how to find and select games that are most appropriate for their situation, including the ICT tools they have available. Schools with low bandwidth, for instance, may prefer to install gaming software directly on their computers instead of accessing programs online. IICD partners in rural Kenya are experimenting with educational software such as 'G Compris' and 'Tux Typing'. These games are not the newest, nor do they have the best graphics, but children definitely see them as an exciting addition to regular classwork. These games are also suitable for 'thin-clients' or computer equipment that is somewhat dated, since there is no need for a powerful graphic card, a fast processor or a large store of memory.

2. IMPROVING TEACHER COMPETENCES

IICD's work is increasingly centred on the transformative potential of ICT in combination with pedagogical skills. For example, teachers can improve their method of instruction by using videos for self-assessment, and they can engage their students through interactive games. Training in basic ICT skills and ICT-assisted learning familiarises teachers with the different types and uses of digital materials. Training is equally important to introduce ways of integrating ICT into usual classroom routines, so that newly acquired skills can be immediately applied.

IICD's work with teacher training colleges helps them integrate ICT into their curricula. We also collaborate with institutes that provide on-the-job ICT-related training for teachers.

Separate computer access for teachers and students
Teachers are often hesitant to display their (lack of) technology skills in front of pupils. It is therefore ideal for them to have their own computer or a computer lab where they can work in privacy on materials and learn technical skills. If teachers must share a lab with students, it is useful to have a timetable with separate hours for students and teachers. The DEC project in Ethiopia recognised this problem. It adjusted the timetable of its school computer labs to give more time to teachers than to students, since students master computer skills much faster. An additional computer skills training centre was also created where teachers from several schools can come together to learn to develop materials and share them.

Increased collaboration among teachers
Introduction of ICT in schools has led to intensified collaboration among teachers. Developing learning tools together provokes discussions about teaching strategies and methods. Sharing materials and experiences is easier when teachers are used to working together, and colleagues activate one another to further improve their results. IICD has long supported networking among teachers. Online and offline knowledge sharing platforms motivate and stimulate teachers to share experiences, even at the national and international level. TIC-EDUC in Burkina Faso is a good example. A mailing list maintained by the project has been a knowledge sharing hub since 2006. It is currently used by more than 200 teachers.

Use of ICT to improve pedagogical skills
In several countries, IICD works with partners using video to improve pedagogical skills. Teachers record themselves in the classroom and assess their own teaching. Coordinator Aniley Gemtessa explains how this works in the DEC project in Ethiopia: 'A first aim is self-assessment. Teachers observe their voice, movements and the way they invite students to participate. Secondly, the videos are used for peer assessment; teachers give each other feedback on their teaching practices. Finally, the project supervisor collects the best videos to use in teacher training.'

One aspect that the Ethiopian teachers especially appreciate is that they control what they share. If they are not satisfied with their video, they make a new one, improving their classroom practices. Gemtessa adds, 'Sometimes they make a movie showing themselves before and after the assessment, to show their progress. There is only one camera per school, so they often use their own mobile phone to make the videos.'

3. IMPROVING SCHOOL MANAGEMENT

Early on, IICD and its partners tended to view ICT support for school administration and management as a add-on service, with priority given to ICT for learning and teaching. Today, ICT for school management receives as much attention in our programmes as ICT use in the classroom. Manual administration in schools takes time that could be better spent supervising and teaching. Use of computer software for administration also improves accuracy, for example, of students' grades and attendance figures. Digitisation of school administrative systems is relatively low cost. It therefore offers a 'quick win': administrators and teachers pick it up easily, and it is often a first step towards the more challenging use of ICT in teaching. Since 2011, IICD has supported projects to monitor teacher and student performance, often with the use mobile phones.

Efficient administration with low-cost ICT services
Many partners report great leaps in efficiency once they start using school management information systems. An impressive example comes from the ACEM project in Malawi. School principals there had ten lengthy forms to complete in fourfold each month. The forms then had to be sent to the district educational office, where more work was done entering the data into the central system. This was time-consuming and error-prone. The principals now use Excel spreadsheets, and the job takes only an hour a week. Following a similar transition, school principals in the DEC project in Ethiopia reported effective gains of twelve working days per school year, as recording administrative data had become much simpler.

School management systems need not be expensive. While there is a lot of expensive software on the market, much can be done using low cost, widely available (open source) programmes. These can be easily rolled out to cover a larger number of schools at little additional cost.

Involvement of parents in monitoring school performance ICT can be used to strengthen ties between parents and the school, increasing parental involvement and commitment to a good education for their children. Several IICD-supported projects are implementing reporting systems to map teacher absenteeism, which is a challenge especially in remote areas. Computers for Schools Uganda (CFSU) and Rwenzori Consortium for Civic Competence (RWECO) are using text messaging to raise awareness among parents and teachers of the importance of school attendance as well as to monitor school performance. Bulk SMS messages to teachers and community members spotlight educative topics, announcements and reminders of meetings. Parents can also text their views, for example, about teacher attendance at school, school administration, sanitation and hygiene, and the quality of teaching materials.

In Ghana, a similar pilot did not work out as expected and an alternative was devised. Stephen Agbenyo of Savana Signatures explains: 'We tried to use SMS for parent participation but have been struck with the reality that a good number of the parents are not literate. We are currently using voice messaging. This way, the messages are recorded in the local language and then sent as a phone call to the parents.'

The rural-urban digital divide
In most of our partner countries, ministries of education are developing online services to ease administrative burdens.

This obliges all schools, urban as well as rural, to be online. Yet many rural schools have no ready internet connection, which creates a problem. The schools involved in the Maasai4Change project in Kenya are a good example. Every year a group of primary school students in pastoralist regions have to sit for exams. But registration for these exams must now be done online. Since the pastoralists have no internet connectivity, the school had to collect money from the students and hire someone to register them using the facilities of an Internet café, located some three hours away by motor-bike. As this situation illustrates, creating ICT solutions with partners in remote rural areas becomes increasingly important as urban areas move ahead and the digital divide widens.

CASE — KEEPING TEACHERS ENTHUSIASTIC ABOUT RURAL SCHOOLS

ICT is seldom the number one priority in rural schools – there are so many pressing needs to be met. However, ICT, and especially Internet connectivity, can play a key role in solving many of the different challenges that rural schools face. One of these is staff retention. Distance from family, friends, (urban) entertainment and information make rural schools less attractive to teachers, many of whom are just out of urban-based training colleges. IICD has observed first-hand the major difference that Internet can make in rural teachers' job satisfaction. It gives them a way to connect with their loved ones and access professional information and guidance. It also boosts the image of work in rural areas. A teacher from the AIC Girls Boarding School in rural Kajiado, Kenya, explains how computer and Internet access made a difference to her: 'I feel recognised in my job, I feel more professional, and I am more enthusiastic about my job.'

4. STRENGTHENING YOUTH EMPLOYABILITY

Integrating ICT skills into vocational training is a key area of IICD support. Occupations such as carpenter, tailor and welder are the backbone of many communities. Local availability of such vocations is especially important in developing countries where manufacturing industries are emerging. ICT skills are valuable in most jobs, and integrating ICT into vocational curricula improves the relevance of schooling in any area. Business skills, like marketing, administration and accounting, as well as life skills and career development, are all aspects of vocational training that can be improved with ICT support.

IICD focuses its capacity development on instructors at vocational training institutes. The projects that we support teach them to use simple ICT tools to create educational content that is relevant to their students and context. Students get to work with their hands, but they also watch videos showcasing work done by peers and digitally document their own products and projects. Business skills is another area where IICD helps vocational training institutes develop targeted ICT-related courses.

Relevant training for better employment
In Lusaka, Zambia, IICD collaborated with the Chawama Youth Centre to create ICT training courses to provide the local youth better computer skills. After following a course, some 60 per cent of the students, many of them women,

have found employment as secretaries and salespersons. A recording studio was also established, where students learn to record their music and find assistance in marketing it under their own label.

ICT has been integrated into occupational courses as well, for example, with drafting software used in carpentry and tailoring. Students have quickly become adept at using the Internet to search for new designs and ways to market their products.

IICD partner ACDEP (the Association of Church-based Development NGOs) has developed 'light' ICT courses tailored to specific vocations for use in Ghanaian schools: software for carpenters to do cost calculations, basic bookkeeping tools for market women, and pattern design for batik producers.[5]

ICT to improve the image of vocational training
Vocational training is often considered to be for people with little capacity to learn. Integrating ICT into vocational training boosts the image of such training among parents, students and instructors. According to Isaac Chanda of Ndola Youth Centre, many Zambians used to think that vocational training was only for dropouts. The Centre not only integrated ICT into its vocational training, it also introduced the use of media like television, radio and SMS messaging to raise awareness and dispel negative stereotypes.

5. INTEGRATING ICT INTO POLICY AND STRATEGY

IICD advises national education ministries on ICT for Education policies. To date, we have been a helpful partner to the governments of Bolivia, Burkina Faso, Ecuador, Tanzania, Zambia and Malawi.

IICD also supports strategy development in ICT for Education at the regional and organisational levels. Our experiences in grassroots education projects feed into our inputs to policy development at the regional and national levels. We connect local experts and ICT champions with higher level policy developers, stimulating policies that are based on local expertise. This approach creates a win-win situation: government gains access to on-the-ground expertise and lessons and project partners find recognition for their efforts and perhaps access to additional funding.

Donor alignment
In most countries multiple donor organisations are involved in ICT for Education, though they are not always aware of what the others are doing. To ensure coordinated support for policy formulation, IICD closely collaborates with a spectrum of organisations. In Malawi, an ICT task force at the level of the Ministry of Education, Science and Technology unites all major donor organisations (the World Bank, UNICEF, USAID, GIZ and others). Buy-in of these donors is essential

to develop an effective implementation plan for the use of ICT in education.

Parental involvement to ensure sustainability
The financial future of ICT in schools is more secure when parents and the wider community are involved. In Bolivia, 235 schools are establishing computer labs. To ensure the sustainability of the labs, teachers, parents and the community own and operate the labs together. The labs also function as community Internet cafes. Parent-teacher associations and residents contribute to cover recurrent ICT costs, such as maintenance, Internet service costs, ICT manager salaries and office expenses.

Beyond any one school or institution, it is important to seek political support from local and national education authorities to ensure funding and recognition in the long term. During a country-wide learning event organised by IICD, Ingrid Guzman Soto, TAREA project coordinator in Peru, had the chance to visit schools in Bolivia: 'I saw that not only teachers and communities are involved in the use of ICT for education, but also local and national government and companies. Seeing how Bolivian schools do this gave me many new inputs and ideas, both for school management and pedagogy.'

SUMMARY AND TRENDS IN ICT FOR EDUCATION

IICD contributions increasingly centre on the transformative potential of ICT. In teacher training colleges, teachers improve their classroom skills through (self)assessments using video. In the classroom, a more engaging and student-centred pedagogy is facilitated by interactive learning tools and software, digital games, photography and video. Teachers benefit from ongoing training in the use of these resources. That training, furthermore, needs to combine ICT and content development skills with student-centred methods of teaching.

As digital educational software becomes more complete and widely available, teachers no longer need to develop everything themselves. IICD helps them find a balance between using and adapting materials from elsewhere and developing their own. For IICD, teachers remain in the driver's seat when making these decisions.

Integrating ICT into vocational coursework gives graduates a better chance in the labour market. IICD and local partners increasingly focus on the development of tailor-made courses to meet the needs of specific business sectors, for example, introducing computer-assisted pattern design for batik producers.

Digitisation of school management systems is often a first step towards the more challenging use of ICT in teaching. School managers are attracted by the quick efficiency gains of computer administration. Data collection is improved and accuracy as well, for example, of students' grades and attendance figures. Also, the cost of computerised school management systems is relatively low.

A supportive management remains key to the success of any ICT for Education initiative. In our social innovation approach, sensitisation of decision makers is an essential step that cannot be overlooked. However, it has its limits if other interests turn out to be stronger. In the end, an enabling environment has to be in place for ICT to be of sustained added value for education.

IICD focuses on involvement of local communities, parents in particular, in children's education. ICT, especially mobile telephones and SMS platforms, open new communication channels between parents and schools, providing feedback mechanisms for improving the quality and relevance of schooling. We look forward to sharing more about the impact of these interventions in the years to come.

Footnotes

[1] *This publication is an update of the booklet 'ICTs for education: Impact and lessons learned from IICD-supported activities'*
   http://www.iicd.org/about/publications/icts-for-education-impact-and-lessons-learned-from-iicd-supported-activities/
[2] *UNESCO EFA Global Monitoring Report 2012 http://unesdoc.unesco.org/images/0021/002180/218003e.pdf*
[3] *IICD's social innovation process is described in detail in the publication From Need to Sustainability.*
[4] *For more information see, the research conducted by one of IICD's Bolivian education partners CEPAC: http://bit.ly/CEPAC13*
[5] *A video about ICT and entrepreneurship is available at www.iicd.org/articles/struggling-entrepreneurs-in-rural-ghana-increase-business-by-using-computers*

IICD's vision is a world in which people are fully able to use information and technology to better their own future and that of their society.

IICD's mission is to enable 15 million low-income people in developing countries to access and use ICTs to address the challenges that they face, understanding that ICT offers opportunities for increased well-being and sustainable economic development in all sectors.

IICD leads the Connect4Change consortium in which five Dutch NGOs have joined hands to set up and support ICT for Development programmes. Our consortium partner in the education sector is Edukans. Our other consortium partners are Akvo, Cordaid and ICCO. Text to Change is a preferred partner.

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