Thematic Brief

ICT in the Zambian Classroom
Lessons learned from the Education Support Network Project (ESNet)

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This Thematic Brief describes the lessons learned from the Education Support Network (ESNET) project in Zambia: a project developed jointly by OneWorld Africa Zambia and IICD in 2006. The project shows how ICT enhances the quality of existing local teaching materials in the Zambian classroom. The lessons are intended for practitioners in the field as well as organisations that would like to learn from the experiences of this project and implement similar activities.

Most of this brief's content is based on results from evaluation exercises that have been performed with support from IICD and a local Monitoring and Evaluation (M&E) partner over the last three years. This M&E system, which was developed by IICD, consists of quantitative and qualitative assessments. Each year, questionnaires are filled in anonymously by the end-users of the project (all users of the project or a representative sample). The answers are then analysed to discover more about end-user profiles, levels of use and satisfaction, and the impact of the project. This process is complemented by periodical Focus Group discussions which are attended by project staff and end-users in order to reflect on the data that has been collected through the questionnaires and discuss successes and challenges relating to the project, and possible solutions.

Context
The Ministry of Education in Zambia has developed a Strategic Plan that works towards achieving the Education for All (EFA) goals, as agreed upon at the World Education Forum in Dakar in 2000, and the Millennium Development Goals. It aims to achieve universal access to quality primary education and gender equality for both boys and girls. Access to primary schools has improved in Zambia and enrolment has increased to 92%. But growth in access to upper basic (grade 8-9) and secondary school (grade 10-12) has been limited in the last decade due to rising costs faced by students, deepening poverty, and limited formal job opportunities for parents to enable them to send their children to secondary school. Enrolment at secondary school level is only 30%. There are also widespread concerns about the quality and relevance of core subjects and electives for grades 8-12. Overall pass rates in Zambia are still too low and have remained at the same level since 1996. Rural schools score lower than urban schools, and statistically more boys continue their education than girls.

Zambia Profile
Surface Area (sq. km) 752.6
Population total: 11.9 million
Life expectancy: 42
School enrolment, primary level (% net): 92% (male 90%, female 94%)
School enrolment, secondary level (% net): 30% (33% male, 27% female)
Human development index (UNDP): 165
Source: World Development Indicators database, 2007

Access to communication technologies per 1,000 people
Mobile subscribers: 140
Internet Users: 42.2
Personal computers: 11.2
Source: UN eGovernment survey 2008

Data on the project
Sector: Education
Number of users: 38
Target group(s): secondary school teachers; students (1,400) and school management staff will benefit from this project's activities.

In May 2003, the International Institute for Communication and Development (IICD) held a Round Table (RT) workshop in Ndola, Zambia about Information and Communication Technology (ICT) in the Education sector. The main objective of the RT was to bring together a team of key players from Zambia's education sector as well as ICT specialists to discuss educational challenges and explore possibilities and opportunities for overcoming some of them with ICT.

A number of challenges were identified and corresponding ideas on how they could be addressed were also suggested. One of the challenges identified during the RT workshop was ineffective and inappropriate teaching materials. While some subjects have access to reasonably good materials, it was pointed out that there is an acute shortage of satis-factory teaching materials for other subjects that have a national dimension such as civic and voter education, geography, and nation-al history. And where such materials are available, the content and examples used render them largely incomprehensible in the Zambian context. The main reasons cited for this ranged from a lack of publishing capacity to a failure to involve teachers in producing their own teaching materials.

The Educational Support Network (ESNet) has been inspired by the knowledge that teachers in all schools have their own written teaching notes, which they use in their classrooms. The content, design, presentation, and the educational methodology for written notes might be less than perfect, but what is important is that they are usually phrased in a particular language and make use of examples that speak directly to the pupils in the context of the Zambian culture. The project will use the existing structure and procedures for teachers and enhance them with ICT to improve the quality, presentation and reusability of these teaching materials for an improvement in the quality of education in Zambia's classrooms. The project is in line with the Ministry of Education's Policy "Educating our Future" and the (draft) ICT Policy of the Ministry of Education that views ICT as a key driver for delivering education and training.

Schools involved in the ESNET project

Eight (8) schools are participating in the ESNet project from 4 provinces: in Ndola (2) and Chingola (1) from the Copperbelt, in Kabwe (2) from Central Province, in Kafue (1) from Lusaka Province, and Livingstone (1) and Monze (1) from Southern Province. The schools were selected on the basis of their infrastructure, specifically whether they could accommodate the activities developed by the project. The criteria was two-fold: the location had to be outside Lusaka and easily accessible, and an Internet Service Provider (ISP) had to be available in the area. The first step at each school involved connecting the school to the internet. The schools in Choma and Kabulonga (Lusaka) took also part in the pilot project but, due to difficulties with connectivity, the fact that no teachers' notes were being submitted, and the low involvement of school management, the project was terminated at these schools. The successful schools mostly had younger teachers and headmasters who recognised the value of ICT and who themselves asked for ICT training to make the change possible.

One World Africa (OWA)

The ESNet project is implemented by One World Africa (OWA), a not-for-profit organisation founded in 1999 to promote sustainable development and social justice in Africa. It achieves this by providing more people in Africa with the capacity to utilise locally available knowledge through the use of ICTs. The ESNet project started in 2006.

How does ESNet help the teachers?

The ESNet project helps teachers to generate, package, share and use supplementary teaching notes. This is the main objective of the project. It was informed by the realisation that teaching and learning in Zambia is hampered by inadequate teaching materials. In order to achieve this development objective the project focuses on the following specific goals:

- Improving the quality of the teaching notes in eight poorly-resourced high schools in Zambia by harnessing ICT;
- Creating learning opportunities for teachers in the pilot schools;
- Creating teachers' notes and making them available in electronic formats; and
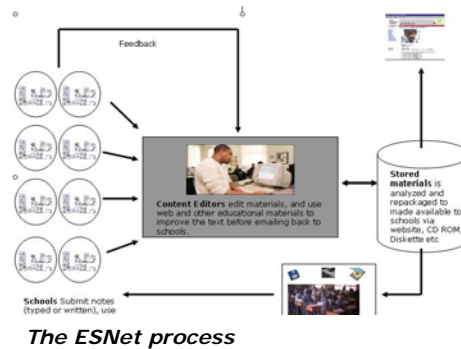
- Establishing and promoting a learning network among teachers in the eight pilot schools.

The original idea was to give each school two computers to install in the teacher resource rooms, so that teachers had access to a computer in order to submit their notes, which would have been difficult in the ICT labs used by the students as these would have been too public. The teachers who participated in the project also received basic ICT training. They would then be able to type out their notes and send them to an Editing Centre so that they could be entered into a standard template. In this Editing Centre voluntary teachers who have received additional ICT skills are then able to enrich the notes with pictures and additional information from the internet. The enriched notes should then be approved by a Project Committee (with participants from the Curriculum Development Committee and the provincial and district Education Officers) and then sent back to the participating schools. The notes can than be used not only by the contributing teachers, but by all the teachers of the participating schools. The notes are now used quite regularly in the schools and teachers are satisfied with how the notes are being packaged and distributed, based on templates the school fills in for the internal M&E system of ESNet. At a later stage in the project, a [website for ESNet](#) was developed. Notes are also distributed through the [iSchool](#) website; a website developed by a local Internet Service Provider ISP iConnect with Zambian Educational Content.

ESNet is designed to pass through four key phases; the first three sets of activities which largely support the conservative approach merely create the right conditions for the fourth 'radical' activity. The first three steps below illustrate how the progression would work.

Step 1. Starts with the familiar practices, proven needs, and existing information flows. In this phase the focus was on building the teachers' ICT capacity to enable them to type their own notes and e-mail them to the Editing Centre. The basic ICT training provided at the outset was one way of motivating the teachers to participate in the project.

The ESNet process

Step 2. Improve teachers' own re-sources and texts, and feed them back quickly to the teachers. In this phase, the focus was on the Editing Centre. Volunteer teachers were trained in advanced ICT skills like web skills, but they also received a financial incentive.

Step 3. The text would then be fed back quickly to the teacher or school in such a way that they would:
Remain recognisably theirs – so that they own and are proud of the material they have produced - and which others can use;
Be available in a form with which they are most familiar – probably an A4 print-out, and in lesson-size batches;
Also be available in web-format, with useful links to many other resources;
Be made available, in principle, to all other teachers.
In this phase the focus was on distributing the notes, both on CD-Rom and through the website.

Step 4. represents a radical step from the above conservative approach. It leads to the creation and adoption of new local materials like video materials. The existing digital materials would also be analysed to identify common ideas and best practices. After the pilot phase, the project intended to become embedded at two levels. At the school level where it would become part of the school budget, and at the Ministry of Education level were the pilot would show-case how ICT could be used to upgrade existing teaching materials at the national level.

At every school, ESNet always started with a Sensitisation Workshop. Not only were the participating teachers included in the work-

shop but teachers in general were, as well as the school administrators and the principal. We have discovered that such Sensitisation Workshops are an ideal way of convincing managers and administrators within the schools of the benefits that ICT can bring. It is therefore vital to open up the Sensitisation Workshop to a wide audience: not just to the teachers who will have a direct role to play in the project, but to all members of the teaching staff, especially the school principal and the administrator. A total of 112 participants were sensitized in the 8 schools through the ESNet project. But the main turning point in the project was a specific workshop for headmasters only, to address key issues at the school management level like ownership of the project, sustainability, and the role that the headmasters were expected to play as supervisors of the teachers involved. The opportunity to discuss this with peers increased their sense of ownership and active participation in the project enormous-ly. At the 8 schools, forty-five (45) of the teachers were actively involved in the project. They were all trained in basic ICT skills, after which they could contribute notes to the project. Four (4) voluntary teachers were trained in advanced ICT skills to become volunteers at the Editing Centre. In the Editing Centre, the submitted notes were enhanced and re-packaged.

The notes were first subjected to a peer review within the Editing Centre itself and were later submitted to a Quality Control Team consisting of the Editing Team, head teachers, a publishing house and - since December 2008 - also a Standards Officer from the Education Development Centre and a member of the Curriculum Development Centre. After approval, the notes were re-distributed to the schools and uploaded to the website. At first the submitted notes were far below the level that was expected, mainly due to the low typing skills of the teachers, limited access to the computers (which were sometimes used for other purposes), and unreliable internet connectivity.

Ministerial recognition
Since the start of the project in 2006 until April 2009, more than 195 notes were produced, enriched and distributed in English, Civic and Voter Education, Geography and History, although this was less than orig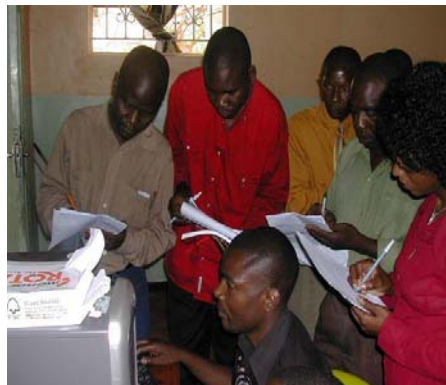inally intended. An electronic discussion group was also started among the teachers to encourage further sharing. The first two years of the project were a learning process: for One World Africa and for the participating schools, but currently this ground work has resulted in increasing participation from the schools and a well-oiled packaging and distribution system. In 2008, the ESNet project was therefore com-mended by the Ministry of Education during the national eLearning Zambia conference.

More emphasis fell on the Editing Centre, which also typed part of the notes, to improve the way in which the notes were submitted. The original plan was therefore changed in order to combat some of these challenges (see **Challenges** below).
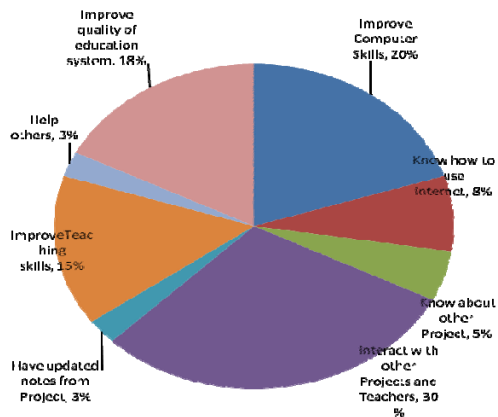
Target group and project objectives
The target group (end-users) of the project are the teachers in the ESNet-supported schools. In 2008, ESNet organised, with support from TEL - IICD's local M&E partner in Zambia - their first end-user Focus Group discussion to review, with the teachers and ESNet staff, their level of satisfaction and perceived impact of the project, with the focus on learning from the past and improvement in the future. The Focus Group discussion was based on the statements and results collected from 29 of the 45 different teachers and staff members participating in the project who filled in an M&E questionnaire.

The majority of these end-users (18) were between 31 and 40 years old. Nine (9) of the end-users were female. The majority were

Teachers make notes during ICT lessons

teachers (18), 2 were managers, 4 were support staff and the remaining 5 were One World Africa staff. Eight (8) live in rural areas, 11 in a provincial town and 10 live in Lusaka. All of them have tertiary education. Most of the teachers (59%) were unable to access ICT on a daily basis, while 31% only had monthly access or less. According to a teacher at St Paul's school in Kabwe: "*The internet provider in the neighbourhood does not provide a very good service, but there is no alternative.*" Another teacher mentioned that "*if the connectivity at school does not work it is far to the nearest internet café, which is about 30 km away.*"

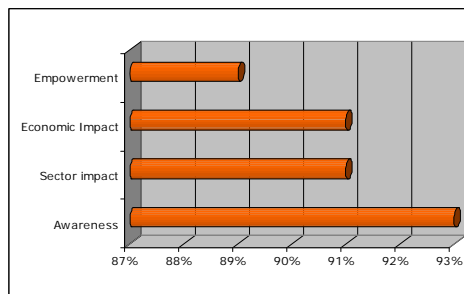### The impact of the ESNet project
The impact of ESNet was measured for the first time in 2008. IICD generally measures impact by asking end-users to respond to a 7-point scale ('strongly disagree' to 'strongly agree') questionnaire and then clustering their statements into 5 main areas: awareness, empowerment, impact on the organisation, economic impact and negative impact. The data collected also classifies the profile of the users, their satisfaction levels, and use of the project. Impact was measured based on 29 questionnaires submitted by end-users of ESNet.

One of the teachers stated "*I wanted to improve my teaching through the use of ICT and also to be afforded a chance to share notes and ideas with the other teachers*". Another mentioned "*To contribute to the improvement of the quality of notes in our poorly resourced school*" others focused more on their own learning "*To be exposed*

to the outside world through usage of the internet*" or simply "*To become computer literate and access information.*"

Motivation to participate
Regarding the teachers' motivation to participate in the project, this varied as you can see in the figure opposite.

Achievement of goals
Based on the questionnaires, 89% of the participants have now achieved their goals. But these goals varied from "*I wanted to edit and submit quality notes to teachers in this project*" to "*I have attended a number of workshops from which I have gained massive knowledge pertaining to information technology.*" Development impact.

Development impact levels of ESNet
The development impact levels that came as a result of the ESNet Project to its end-users consist of the following 4 impact indicators: **Empowerment, Economic impact, Sector impact and Awareness.**

As you will see above, impact levels were high in the project. This was discussed during the Focus Group meeting. An important reason for the high impact was the timing of the project. ICT in Education has been getting a lot more attention recently. The Ministry of Education is more engaging towards ICT than before. Therefore, teachers see the importance of using ICT skills more and more, not only in the classroom, but also as a way of developing themselves further.

Awareness
This is an indicator of impact that shows whether or not end-users of the project see themselves as having become more aware of the possibilities of ICTs (for their work). Almost all the end-users (93%) mention that

their awareness for opportunities through the project has increased. All of them feel more responsible for ensuring high quality education. Fifteen (15) felt strongly about the fact that they now see opportunities in ICT that they did not see before and that participating in the project has broadened their horizons.

Empowerment

This is an indicator of impact that is one step up from 'awareness'. It indicates what people have done as a result of their awareness. The project has improved empowerment a lot among the teachers. Twenty-six (26) users (89%) feel more empowered by their participation in the project. Twenty-one (21) teachers mentioned that they have inspired others since participating in the project. Twenty-seven (27) have gained useful computer skills and 23 have gained more self-confidence. Some (14) are more involved in decision-making at their schools. And 25 teachers now use the computer for other purposes as well, not just for the project. Examples of actions undertaken are *"I acquired an e-mail address which helps me to research my lessons"* or another *"I produced my own teaching notes and sent them for editing and I now have detailed notes that I can use and share with other teachers who are not part of this project."*

Economic impact

This indicator refers not to direct financial gain in the case of an Education project, but to better (job) prospects for teachers in the future and more productivity in the classroom. Most end-users, 26 (91%) see a positive economic impact on their lives. Twenty-three (23) work harder than they did before they participated in the project. Eighteen (18) envisage better job opportunities in the future (which could be a negative impact for the schools, but is seen as a positive economic impact for the teachers) and 21 end-users are more motivated to do a better job.

Sector impact

This refers to the influence the project has on the Education sector as a whole and on the schools in which it is active. Twenty-six (26) end-users noticed a positive impact of the project on the Education sector. Nineteen (19) teachers saw an improvement in their course materials. Eighteen (18) of them saw an improvement in their teaching methods and noticed further professional development. Only 16 saw improved access to infrastructure and connectivity. Seventeen (17) teachers are now better informed about issues in the Education sector.

Challenges

Since the start of the project ESNet has faced several challenges):

The importance of ensuring local ownership: In the first phase head teachers did not take a keen interest in overseeing either the implementation of the project in their school, or the effective management of communication about the project, despite signing a formal Memorandum of Understanding with IICD and One World Africa. This was partly due to a lack of ICT skills among them, which made them doubt their ability to manage the project. Several activities took place to increase the involvement of the school management, including capacity building. The turning point for the project with regard to achieving more local ownership was a meeting that took place exclusively with the school managers. It was very clear that if the school managers did not see the value of ICT and their own role in this, the project could not become sustainable. The most successful schools in the project have school managers that encourage teachers to participate in the project, because they see its importance for the future of their students.

Identifying the profile of the Project Coordinator, and then retaining the best candidate for the job. From the start, ESNet searched for a Project Coordinator who had a thorough understanding of the

Teachers trained in basic ICT skills

Education sector, who was able to talk with the different stakeholders (teachers, head-masters, representatives from the Ministry of Education), and who was able to manage the project. A difficult combination to identify and, when found, difficult to retain in the project. The effect was a high turnover (4 Project Coordinators) during the whole process. ESNet did not change the profile of the Project Coordinator during the project, but instead changed the importance of the different skills and has now put more weight on the coordination aspect.

Accelerating the flow of electronic lesson notes from teachers to the Editing Centre. The biggest challenge faced during the two-year pilot period was the slow flow of notes from the teachers to the Editing Centre. This was partly a result of setting over-ambitious goals for outputs each quarter. It also emerged that the original quarterly target of 117 notes for the schools was unrealistic given the workload of the teachers and the fact that during examination time and holidays, teachers do not work on the ESNet project. Therefore, OWA reduced the targets to 48 notes per quarter.

Attracting volunteer teachers to work at the Editing Centre. The original idea to engage volunteer teachers also proved to be a challenge, although it has worked out to a certain extent. The amount of work to be undertaken by volunteers was underestimated mainly because in the original plan, schools were expected to submit typewritten notes. However, because of the lack of typing skills amongst teachers, schools were later requested to submit handwritten notes in a bid to increase the flow of notes. This also meant the volunteer Editors had to do a lot more work (6-9 hours for a long lesson and 4-6 hours for a short lessons) so the remuneration for the volunteer Editors became unrealistic. ESNet therefore had to improve the allowances for the Editors.

Maintaining internet connectivity. Many schools are disconnected due to non-payment of bills. This is related to the ownership challenge. To make the project sustainable, some of the schools tried to set up an internet café. However, that requires certain entrepreneurial skills. This makes it difficult for schools to generate revenues from students, teachers and other community members to provide for computer maintenance and connectivity. But this requires entrepreneurial skills, which are not always found among civil servants. Other schools tried to negotiate with the Parent Teacher Association (PTA) to increase the school fees by a small amount to pay for connectivity and computer maintenance.

Measuring success. In the original plan, the number of students passing their exams was used as an indicator to measure success. It was difficult to measure the causal relationship, however, because the ESNet project focuses on building the capacity of the teachers, not the students. Therefore, success is now measured in an indicator that is clearly influenced by the project: the number of notes submitted, enriched, re-packaged, distributed and used.

Motivating the teachers. Many teachers participate in this project outside normal school hours. The computers that are avail-able to the schools are often in use by others, which can demotivate the teachers who participate in the project. The teachers should be able to use the equipment at all times, and any additional time they have to spend on the notes should be allocated by the schools.

Lessons learned
Several lessons were learned:

ICT can be used to enhance existing systems. The project was built on what was already in place in the schools. It simply enhanced the local existing structure to improve notes already being produced by teachers for their own use. ICT was not used to do something completely new. This has improved the acceptance of the schools and the chance to embed the skills they acquired through the project in the future as well.

Improving the editing cycle. At the start of the project the cycle for notes - from submitting and improving them to repackaging and distributing them back to the schools - did not work very well. Fewer notes were submitted than expected. Editing and redistribution also took much more time than originally anticipated. Although the input of notes was limited in the first years, it still took more time than expected to enrich the notes and provide feedback to the school with improved notes. After meetings with the schools, the editing cycle (editing, repackaging and distribution back to the

school) was improved. This has also resulted in an increase in the number of submitted notes. Expect that the preparation needed to develop a new service takes time to fine-tune the whole production process.

Expanding the distribution channel. The original plan of the ESNet project was to distribute the enhanced notes via e-mail and CD-ROM. New platforms became more common so the notes are now also shared through the ESNet website and iSchool; a platform to share lessons plans with additional schools.

Enhancing job opportunities. Some teachers use the skills they have developed as a stepping stone to increase their income by becoming an ICT trainer. This is positive for the individual teacher, but can be seen as a negative impact for the schools as they lose a valuable teacher.

Embedding at the national level in the Education sector. It took a lot of time and a great deal of effort to obtain recognition from the Ministry that the project indeed shows that ICT is effective for upgrading existing teaching notes in schools. Participation in the Quality Control Teams in Dec-ember 2008 by a Standards Officer from the Education Development Centre and a representative from the Curriculum Development Centre is the first step, active participation in the whole project the next. But to convince the Ministry of Education that this could be used at the national level would take even more time, investment, and persistence in the future.

The next steps and future plans

To meet the challenges and use the suggestions for improvement collected in the questionnaires and the Focus Group discussions, ESNet would like to initiate the following activities:

The actual projects on the ground (the 8 schools involved) should **create a network of teachers** to share information with each other. A Dgroup has begun with Mrs Mildred Kalida from Livingstone as the moderator. Knowledge sharing has started, but further encouragement of the contributors is still necessary. This is also mainly due to chronic connectivity problems at some schools.

Make the project more sustainable. By involving the school managers, other sources of funding could be explored such as asking $2 per student to pay for connectivity and maintenance of the computers or some schools have already started doing is setting up a small Business Centre with ICT classes outside school hours, with e-mail, print and copy services offered for a small fee.

The ESNet project is in the process of buying additional PCs from Computers for Zambian Schools for a reduced amount to **increase the number of PCs in the participating schools.** ESNet has already helped 3 schools to purchase more refurbished computers, but the other 5 will hopefully follow.

Obtain ministerial recognition. The ESNet project was recognised by the Ministry of Education with a presentation at the national eLearning Zambia conference in 2008. But more activities are needed to show the Ministry the essential need for schools to prepare electronic lesson plans and that this would provide quality material in an efficient way. This could certainly boost the project to a national level.