

Impact case study: Savana Signatures

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Executive summary

This evaluative case study documents the programme run by Savana Signatures, supported by IICD and Edukans, to build the capacity of schools in northern Ghana in the effective use of ICT. Each participating school has been provided with a range of technology and associated training. The theory of change for the programme is that if teacher capacity to use ICT can be improved, and the school management and administration through ICT can be improved, then student learning outcomes will improve and their participation in school will increase. Therefore, the objective of the exercise is to understand, demonstrate and capture the impact that the introduction and use of ICT is having in the programme schools in regard to teacher capacity to make effective use of ICT in effective teaching, school management and administration capacity to make effective use of ICT, and student learning outcomes.

The primary research for the study was undertaken during two field visits to Tamale, the first in September 2013 and the second in May 2015. The methods employed for the research included participatory observation, assessment of schools records, interviews with teachers, heads and administrators, focus groups with teachers, and pre-post testing. The analysis examines the way in which the programme has had an impact in the following areas: the impact on teachers, the impact on head teachers and school administration, and the impact on students. The focus on these three areas enables an overall assessment of the programme theory of change.

The research suggest that the programme has had a significant positive impact on some teachers. This is expressed primarily in their increased confidence in using ICT in teaching and planning lessons, and in after school activities. The impact of ICT on teachers lies primarily in the effect on their confidence in its use. The increased confidence to use ICTs, however, did not yet appear to result in consistent changes in teaching practice, particularly in the areas of lesson preparation and presentation.

The impact of the programme on head teachers echoes the findings from teachers. The research demonstrated that their confidence and motivation, and efficiency in carrying out administrative tasks, had significantly improved. The benefits of the programme are naturally compounded in the head teachers due to their role and their regular access to a dedicated computer. The potential role of ICT to enable head teachers to be more effective in their oversight and administrative capacity is an important building block for technology in education.

The majority of students in the participating schools had little or no prior exposure to ICT before the programme. Within this context, the input of ICT into the programme schools has played a contributing role in increasing enrolment and attendance. During the programme lifecycle attainment levels have increased significantly in the majority of the participating schools, and also in the majority of other schools across the province. However it is not yet possible to attribute the change directly to the programme inputs.

The research demonstrates that the ICT inputs and training provided by the programme have contributed to a positive impact on ICT use in school management, teacher confidence and capacity. However, substantial and sustained improvement in learning outcomes is likely to require on-going, in-depth inputs over several years as part of a comprehensive educational

change process.

IICD and Edukans have played a central role in supporting Savana Signatures through financial support, training, mentorship and technical expertise. Their support in the initial phase of the programme has led Savana Signatures to extend the programme to other schools in the province. This model has built the capacity of Savana Signatures, and broadened their impact in the region. The case study closes by recommending either focusing future engagement on basic training in a large number of schools with poor attainment, or more sustained and in-depth engagement with a small number of schools.

1. Introduction

1.1. Overview

The partnership uses the expertise and experience of Savana Signatures, supported by IICD and Edukans, to build the capacity of participating schools in the effective use of ICT. The partnership is part of the wider Connect4Change (C4C) programme which has been set up to run from 2011 – June 2015. The C4C consists of a consortium of IICD, Edukans, Cordaid, ICCO, AKVO and TTC and is led by IICD. The C4C programme supports activities in the education, health and economic development sectors in 11 countries: Bolivia, Burkina Faso, Ethiopia, Ghana, Kenya, Mali, Malawi, Peru, Tanzania, Uganda and Zambia. The C4C mission is to strengthen people and civil society organisations in the sustainable use of and lobby for ICT to achieve their development goals. Edukans and IICD are the partners within C4C for the Education sector.

1.2. Programme context

IICD and Edukans support 10 schools in which Savana Signatures is implementing educational activities through ICT. In 2012 the program started with five schools and in 2014 the program was extended to five additional schools. Savana Signatures has scaled the programme to a further 13 schools across Tamale, Savelugu and Ho (through funding from C4C and other partners). The programme coordinators from Savana Signatures are John Stephen Agbenyo, Raphael Adomey, Jovia Salifu and Eric Yandanbon. The initial five core schools supported by Savana Signatures as part of the programme are: Darul Hardis, Yilonayili, Yong Dakpemyili, Yoo Roman Catholic, and Pong Tamale Experimental. Each participating school has been provided with the following:

- A computer lab with 11 computers
- A printer
- A camera
- Two projectors
- 1 laptop
- A desktop computer for the head teacher for data collection and management
- Training and support from the programme coordinators (capacity development on basic ICT, ICT pedagogy, and basic hardware maintenance)
- Various additional support, training, workshops, hardware and offline educational software
- Mentorship through the programme
- Knowledge sharing events (workshops and competitions)

1.3. Rationale for impact study

The appropriate use of ICT has the potential to enhance learning outcomes in developing countries. However, designing and implementing interventions in a way that makes this likely to occur is a significant challenge. Often the potential for transformation is not realised because of a missing component within the process: technology is introduced but the anticipated increase in learning outcomes does not occur. Alongside this, there is considerable debate and uncertainty regarding how best to assess impact. Technology enhanced education has the potential to

motivate and engage students and improve learning outcomes. But this potential is not inevitable and many initiatives have struggled to live up to initial expectations. The IICD and Edukans partnership with Savana Signatures was designed with this understanding in mind.

Effective impact assessment cannot be undertaken in isolation and requires a culture of monitoring and evaluation to be built into the very fabric of ICT for education programmes. In turn, focusing on the integration of monitoring and evaluation processes at the outset has a dramatic impact on the likelihood of programme success. For this reason, IICD requested that Jigsaw Consult undertake a longitudinal study throughout the programme, feeding back learning into the implementation process and contribute to the sector more broadly.

An impact study of this nature is not fully detached from the implementation process. In a context like this there is little value in holding back insights until the programme has finished and all operational decisions have already been made. Instead, the Jigsaw research team have shared their observations and suggestions with the programme team throughout in the form of conversations, and interim reports. This case study is one important component – but not the sum total.

1.4. How to use the case study

The case study documents the findings from a two year study regarding the Savana Signatures partnership. It is best read in conjunction with associated reports which add detail and explore particular aspects in greater depth:

- Impact case study on Mpelembe basic schools partnership (C4C Zambia)
- Road-map for impact
- Lessons learned

1.5. Structure of the case study

The case study begins by explaining the objectives of the programme and the methodology used in conducting the evaluation. The analysis is split into distinct areas of impact: impact of ICT on teachers, impact of ICT on head teachers and school administration, impact of ICT on students, and impact of the partnership. The case study then ends with conclusions and recommendations for the future.

2. Objective

The Theory of Change for the programme is that if teacher capacity to use ICT can be improved, and the school management and administration through ICT can be improved, then student learning outcomes will improve and their participation in school will increase. Therefore, the objective of the exercise is to understand, demonstrate and capture the impact that the introduction and use of ICT is having in the programme schools in regard to:

1. Teacher capacity to make effective use of ICT in effective teaching:

- Ability to identify and use offline digital content (use of computers, Excel etc)
- Ability to design lesson plans and deliver lessons using ICT

- Attitude towards and application of children ‘centred’ approaches

2. School management and administration capacity to make effective use of ICT:

- Administrative effectiveness (accuracy of data, tracing of student results, transparency, report writing)
- Administrative efficiency (time and money required)
- Change in mind-set regarding school management

3. Student learning outcomes (participation and attainment):

- Achievements in test scores (national curriculum exam scores)
- Student participation (drop-outs will decrease)
- Student worldview and aspirations (including critical thinking, assumed future)

(It should be noted that the Theory of Change was finalised following the initial implementation of the programme.)

3. Methodology

3.1. Overview of research activities

The primary research for the study was undertaken during two field visits to Tamale, the first in September 2013 and the second in May 2015. The Savana Signatures team facilitated each visit very effectively. The methods employed for the research include: participatory observation, assessment of schools records, interviews with teachers, heads and administrators (scale scoring answers), focus groups with teachers (including scale scoring answers), and quantitative baseline with control schools. The research was undertaken with consideration of a wide range of variables. The research team engaged with a range of different types of teachers and subjects, within a range of different schools and student background. The extent of this was limited by the number of schools participating in the programme. The table below summarised the activities completed.

	Visit 1 (Sept 2013)	Visit 2 (May 2015)	Total
School visit	6 visits	7 visits	13 visits
Interview with teachers	33 interviews	32 interviews	65 interviews
Survey with teachers	33 surveys	32 surveys	65 surveys
Interview with heads	6 interviews	7 interviews	13 interviews

Interview with other stakeholders	4 interviews	4 interviews	8 interviews
Lesson observation sessions	1 lesson	2 lessons	3 lessons
Direct assessment of school records	5 schools	5 schools	10 schools
In-direct assessment of school records	0 assessments	17 assessments	17 assessments

The school visits lasted for between two and four hours and were each completed with two researchers, accompanied by a member of the team from Savana Signatures. Particular effort was made to collect and collate the school records of the participating schools in schools external to the programme for comparison. This enabled a quantitative assessment of the way in which the programme may have had an effect on student attendance and examination results. The interviews adopted a semi-structured approach and a sample interview template can be viewed in Appendix 1. All interviewees were given the choice whether they wanted to be interviewed. Alongside the teacher interviews a survey was also conducted to map the progression of the teacher perspective, confidence and usage of the technology throughout the programme using a three stage ranking exercise (pre-programme, at September 2013, and at May 2015). The 'other stakeholders' included programme staff, officials from the MoE, and figures from within the community.

3.2. Methodological details

There are two specific methodological details worth highlighting in more detail as each of them had an effect on the findings of the study.

Firstly, some teachers in the programme schools were not willing or available to speak with the research team. This was for a wide range of reasons. Some were absent from school or too busy with teaching responsibilities and others were no longer engaged in using ICT and as a result did not want to talk about the programme. The analysis of the teacher responses should be read with this in mind: they provide a slightly more positive perspective on the programme than if all the teachers in the schools had been interviewed.

Secondly, there were macro-level changes in the educational system that had an effect on the programme and the impact and learning study, namely re-classification of schools, and changes in reporting systems required by the Ghanaian education service.

4. Analysis

4.1. Overview

The case study analysis examines the way in which the programme has had an impact in the

following areas:

- The impact on teachers (lesson preparation and delivery)
- The impact on head teachers and school administration
- The impact on students

The focus on these three areas enables an overall assessment of the programme theory of change as outlined in the objectives.

4.2. Impact on teachers (lesson preparation and delivery)

The impact of ICT on teachers lies primarily in the effect on their confidence in its use, though this is impossible to isolate from general trends towards greater exposure to ICTs. The increased confidence to use ICTs, however, did not appear to result in consistent changes in teaching practice, particularly in the areas of lesson preparation and presentation. Nonetheless the findings of the research are positive from a confidence and attitudinal perspective, as teachers felt more confident, but also felt their teaching had improved.

Teacher confidence in ICT

Teacher confidence is a key metric for understanding motivation, capacity and educational attention given to students. In the schools visited, with up to 50 students per classroom and with limited facilities and teaching aids, teachers expressed that they often feel like they are faced with an impossible task and are therefore demotivated. The introduction of ICT, both as a skill at the teacher's disposition, as well as an option to change the style of teaching, has introduced a new level of interest and motivation for some teachers. As expressed by a female teacher from Yoo RC school after completing the training:

'I feel much more confident to use ICTs – I feel like a modern teacher who does not need to rely on using the blackboard. I feel connected to the outside world, and it makes work much easier.'

Teachers were asked to rate their confidence across a range of tasks associated with their teaching work, and almost universally expressed an increase in their confidence to carry out those tasks with ICTs. The teachers explained that they not only feel more capable but more motivated to carry out their teaching activities as well. Thus confidence plays a key role in addressing not only capacity to comply with teaching requirements, but also the manner in which teaching is carried out. The detail of these findings are expressed in the table below. In using computers to write documents teachers went from 61% reporting no confidence before, to 67% reporting very good confidence in 2015. In using ICT to deliver lessons, 84% of teachers had no confidence before the training and 60% had very good confidence after the training, plus 27% reporting 'good confidence.' These findings in changes in confidence show a promising progression which supports teachers not only in their confidence in using ICT, but in giving them self-confidence generally in their work as a teacher, as qualitative responses show.

Question	Response	Before training	At Nov 2013	At May 2015
How confident do you feel in your ability to use the computers to write a document?	No confidence	61%	6%	0%
	A little confidence	24%	12%	0%
	Some confidence	9%	9%	0%
	Good confidence	3%	21%	33%
	Very good confidence	3%	52%	67%
How confident do you feel in your ability to use ICT to deliver lessons that are interesting to the students / of better quality?	No confidence	84%	18%	0%
	A little confidence	9%	3%	0%
	Some confidence	6%	3%	13%
	Good confidence	0%	21%	27%
	Very good confidence	0%	48%	60%

In addition to the scale scoring of their confidence, teachers reported a strong change in confidence in using ICTs in their comments. This was exemplified by a female Maths teacher from Yoo RC who explained: 'I see myself as above the other teachers who did not receive the training, because I have more ability with ICTs, so I am proud of myself.' Similarly, a male English teacher from Yilonayili noted 'I feel that I am a completely different teacher ... I feel very confident about computers now'. Head teachers confirmed this sentiment, indicating that they had seen a change in the attitude of many of their teachers. This confidence and attitudinal change is reflected in the statement of the head teacher at Darul Hardis, who noted proudly that now there is ICT in the school, the teachers 'feel like they are more connected to the world, and their knowledge is up to date.'

Teacher usage of ICT

It is difficult to provide accurate independent measurement of teacher usage of ICT across a school. Usage self-assessment by teachers can be distorted by a range of factors from aspirations to understanding of key frequency terms. The majority of teachers spoke about their regular use of Power Point to prepare and deliver lessons. However, when asked for details, the majority said they only actually used Power Point occasionally, and used the ICT overall in their teaching a few times each month. The reasons stated by the teachers for not using the technology as much as might be anticipated included: equipment failures, a perceived lack of hardware, the time required to move the projector to a classroom, and the fact that the projector can only be used by one class at the time. The picture which emerges is of a few teachers (often including the ICT teacher and a couple of other well-motivated individuals) who use ICT relatively frequently in their actual

teaching practices, and the majority of teachers who use it rarely. There was limited evidence that the well-motivated teachers were able to act as a positive catalyst for the teachers who were less actively involved. The significance of this was explained by the head teacher at Yong Dakpemiylili who noted, ‘my biggest challenge is that I don’t have teachers who are willing to actually use the ICT – they don’t have the zeal to use it themselves.’

Question	Response	Before training	At Nov 2013	At May 2015
How often do you use Power Point to help you in your work as a teacher?	Never	97%	48%	6%
	Occasionally	0%	21%	17%
	Sometimes	0%	15%	12%
	Regularly	0%	12%	53%
	Daily	3%	3%	12%
How often do you use Word for to help you in your work as a teacher?	Never	100%	91%	6%
	Occasionally	0%	3%	0%
	Sometimes	0%	3%	6%
	Regularly	0%	0%	47%
	Daily	0%	3%	41%
How often do you use internet to help you in your work as a teacher?	Never	97%	88%	6%
	Occasionally	0%	6%	12%
	Sometimes	0%	3%	17%
	Regularly	3%	3%	12%
	Daily	0%	0%	53%

Teacher usage in administrative functions

The interviews clearly demonstrated that the programme has had a positive impact on the way in which teachers engage with their administrative roles. This includes the way in which they record attendance and absent students, collate marks from continuous assessment tests, and plan activities for each week and each term. Indeed, the change seen in teacher administration through ICT appears to be more pronounced than change seen in classroom usage. A male maths teacher from Yoo RC stated:

‘ICT is helping with the admin of being a teacher. I used to have lots of paper documents everywhere – now I keep all the records in the computer. These

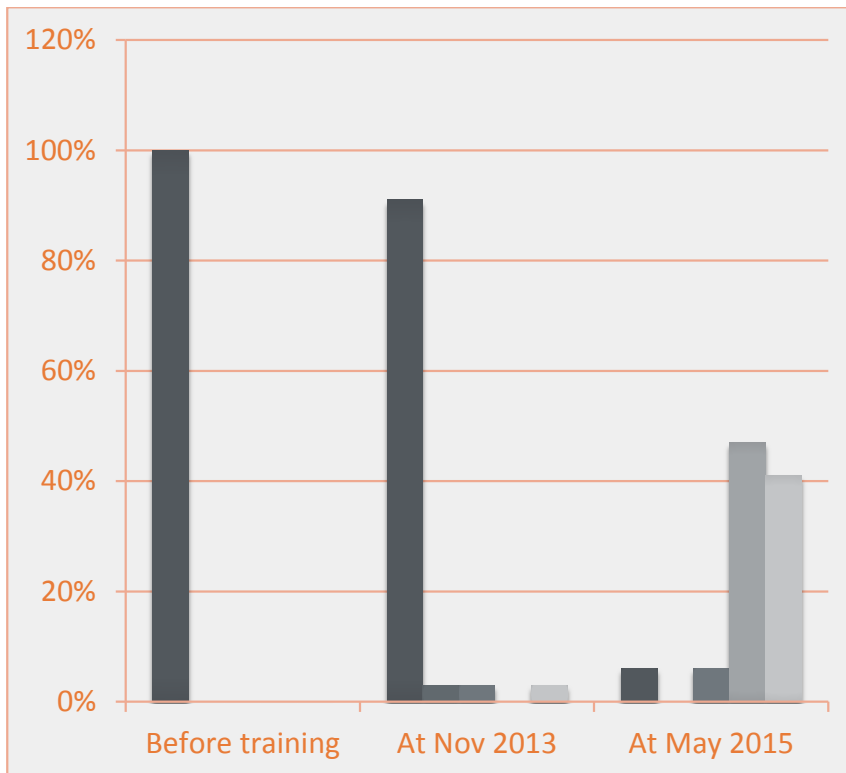
records are much safer. I record the student grades on Excel, to send out reports. The Excel formula makes it much quicker to analyse student records.'

It is these administrative uses of ICTs that teachers consistently mentioned as using most frequently. In Yilonayili, the automatic generation of termly report cards and continuous assessment tools has significantly reduced the time required for overseeing student progress. The planning of lessons digitally was initially a challenge because of the reluctance of the local Ghana education service (GES), which preferred handwritten lesson plans. However between the first visit in 2013, and the second visit in 2015, Savana Signatures worked closely with the GES to improve their capacity to accept digitally produced lesson plans. Teachers in each of the programme schools mentioned the time saved in digital lesson plans, and looked forward to being able to reuse, share and improve these lesson plans in the future as they teach the same lessons in following years. A male teacher of integrated science in Yilonayili explained that: 'using ICTs to plan my lesson-notes is also quicker than having to writing out a copy in the book by hand.'

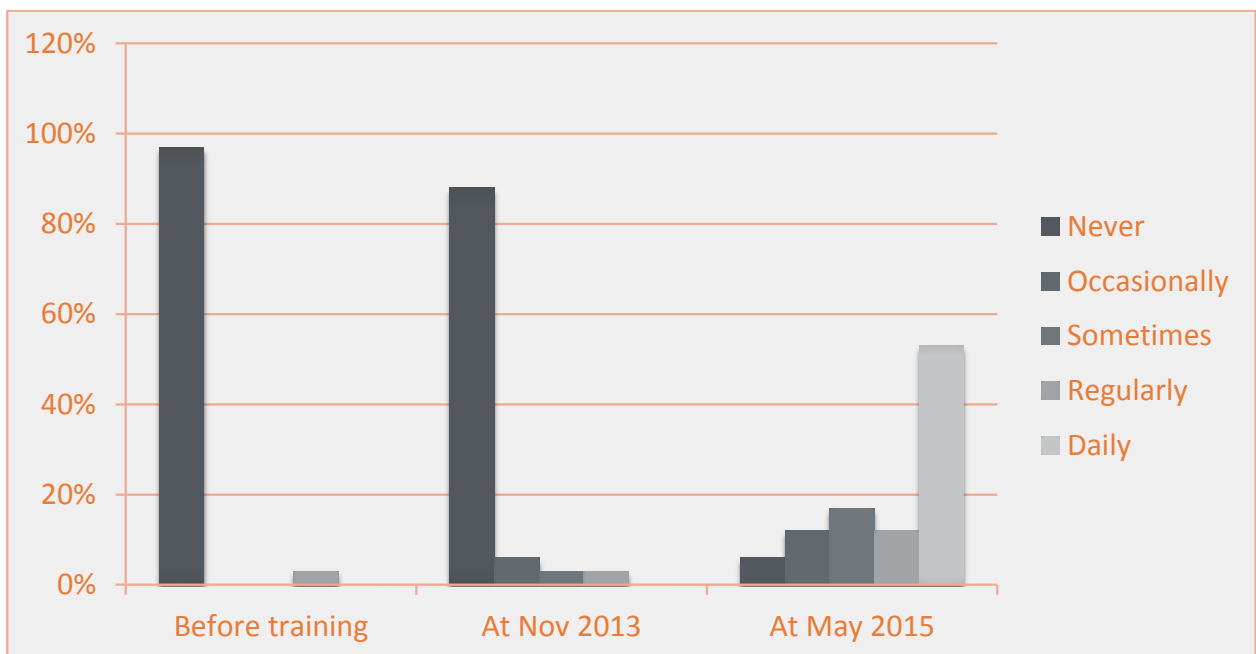
Analysis of impact on teachers

As a whole, the findings from the interviews and surveys suggest that there has been a significant positive impact on teachers. This is expressed primarily in their confidence in teaching and planning lessons, as well as their effectiveness in non-teaching activities which they undertake at school. These impacts further suggest that greater change can occur in teaching practices through the engagement of teachers in regular use of ICT for lesson preparation and presentation. The teachers went from 97% having never used Power Point to 53% reporting that they use it regularly, and 12% daily. Likewise usage of Word goes from 100% reporting having never used it to 47% reporting regular use and 41% daily use. Internet use showed the greatest gain in daily use, going from 97% having never used the internet before the training, and 53% reporting daily use in May 2015. While these figures are self-reported and not externally verified, they indicate an increase in usage in any case, and a confidence to use a range of tools.

How often do you use Word to help you in your work as a teacher?



How often do you use internet to help you in your work as a teacher?



The impact on teacher confidence in use of ICTs and their self-perception of their usage patterns shows promising results from the implementation of ICTs through the programme. In addition, the schools show the early signs of being able to make system-wide efficiencies in recording and

reporting attendance and grades. This in time should allow teachers to focus more of their time on teaching in the classroom. These are positive outcomes that should be highlighted from the programme. The positive impact on teachers is likely to be increased by focusing on on-going training. More in depth, longitudinal training for teachers, as well as more comprehensive technical support and greater distribution of resources (projectors, internet connection, etc) is needed if teacher confidence and competence is to improve to the extent where it results in widespread change in practice.

4.3. Impact on head teachers and school administration

The impact of the C4C programme on head teachers echoes the findings from teachers. The interviewees reported that their confidence and motivation, as well as the efficiency in carrying out administrative tasks, had significantly improved. The benefits of the programme are naturally compounded in the head teachers due to their role and their regular access to a dedicated computer. The head teachers demonstrated an appreciation for the programme and a willingness to engage with ICT. As noted by a male head teacher at Darul Hardis:

'We were invited to be part of a regional ICT competition, and our school did so well that we won a laptop and I was so proud that it was the happiest day of my life.'

In addition to the widespread sense of pride an increased confidence that ICTs brought to head teachers, they have begun using a range of administrative tools to enhance their work. There are a wide range of different ways in which the participating head teachers are using the ICT, but each had a dedicated device in his or her office, in which they recorded school data (primarily in Excel spreadsheets) and created documents (primarily in Word). These were the two most widely used software tools, though use of Power Point and others were mentioned in interviews. The head teachers explained that they have benefitted significantly from the greater administrative capacity which the programme has enabled. This includes:

- Recording and saving data in spreadsheets (and learning to use Excel)
- Producing administrative documents and reports
- Continuous assessment templates, and linked automated report cards in Excel

The use of ICTs in record-keeping, marking attendance and grades, and continuous assessments has saved time for both teachers and head teachers in their everyday work. This allows them to have more time and attention for the core activities of teaching and learning, and potentially reduces their workload. The use of ICTs to write and print letters, documents and generate report cards also saves a significant amount of time and money for schools, and allows them to present a more professional and official face to the community. Head teachers cited these factors as all contributing to their pride in the opportunity to do their jobs well. The head of Yoo RC stated that she feels confident to be a leader anywhere because she is advanced in ICT use: 'I can keep up with teachers and students, and I am equipped to the changing times of the world.'

The programme team recognised the dependence within the education system on different spreadsheets to record and analyse different types of school and student data (attendance, contact details, behaviour, performance, compliance). This led them to begin working on plans for

a customized Open Source School Management Information System. The system is developed by TechSupport (a local ICT4D organization) and Savana Signatures based on requirements of GES and the participating schools (supported by IICD and Edukans). Savana Signatures (supported by IICD) has begun the implementation at their schools, however further work is required. Head teachers widely welcome the possibility of an integrated system for the data collection and management needs of the school.

Head teacher are able to oversee students and more thoroughly track their progress, as well as being able to identify students who face difficulties more quickly than previously. The way in which ICT has the potential to enable head teachers to be more effective in their oversight and administrative capacity is an important building block for technology in education. When head teachers are able to operate more efficiently using ICT, they can also be more confident in stepping into the role of technology-champion for the school.

4.4. Impact of ICT on students

Exposure to devices

Most interviewed teachers reported that before the programme, the students in their classes had never had any direct access to ICTs before they were introduced into the schools. This is despite the fact that ICT is a compulsory subject on the curriculum. In schools that do not have ICT facilities, the subject is taught through posters and in writing. As would be expected, teachers noted that it was significantly easier for the students to learn about ICT now that they actually had physical access to the devices. The presence of ICT devices in the school serves as a motivation for the students and provides a foundation for potential further learning.

Impact on student enrolment and engagement

The input of ICT into the programme schools has played a contributing role in increasing enrolment and attendance. The attendance and enrolment in four of the five schools (all except Yilonayili) have shown significant increases during the programme lifecycle. The head teacher of Darul Hardis explained in his interview that parents are now showing a preference for the schools participating in the programme, because of the presence of the ICT and the opportunity this provides. He stated:

'There is higher enrolment because of ICTs – students came from other schools because of the ICTs. They now have to have double classes for each form. The enrolment before was 175 children. Students are means tested for enrolment now.'

The head teacher of Yong Dakpemyili echoed this sentiment: 'For enrolment – when I came we were only 72, but now I think we are more than 200, so the parents, as you can see, are sending their children more.' Other head teachers gave examples of villages which were further away sending children to study at their school because of the opportunity to use ICT. The increase in enrolment, along with reported improvements in attendance suggest that parents and community members place high value on education with ICT, and will work to ensure that their children have access. The assistant head teacher from Yilonayili stated:

'Initially our enrolment was low: we only had 24 in form 3 and now we have 62 students, just in form 3. This means we have taken students from other schools, even from far away, from another village Yenyeshé after the hotel, and another called Duku and they come even by bicycle to this school because it is better, now that we have ICT. We are even taking students from Baba Barassie even though they have a computer lab there.'

Similarly, three of the five head teachers reported that the introduction of the programme has led to a reduction in truancy and skipping classes in their school. In interviews, teachers repeatedly emphasised the way in which student engagement, participation and motivation within classes has improved as a result of the programme. They note that interest in lessons, motivation to do homework, or to stay after classes to do schoolwork on computers, has increased. The impact on lessons was exemplified by a male English teacher at Pong Tamale who noted: 'I feel that students need to see things to learn better, and the projector lets me show students pictures that I have found on the internet.'

Impact on student performance

During the programme lifecycle attainment levels have increased significantly in the majority of the participating schools, and also in the majority of other schools across the province. There has been a province-wide initiative to enhance learning outcomes through a range of extra support measures. Within this context the pass rate of BECE exam results (the standardised test which determines which students pass into secondary school) for entry into secondary school across the province improved from <10% to >24% from 2011-2015. Examination data from a wider sample of schools demonstrates that those schools where Savana Signatures is implementing the programme improved by more than the average for the province. To exemplify:

- 24% to 55% Yoo RC for passing from Junior High School to Senior High School
- 30% to >95% Pong Tamale for passing from primary to Junior High School

Within the study it was only possible to obtain comprehensive records from Savelugu municipality. Within the Savelugu municipality the three schools participating in the programme showed slightly better improvements than the average but not to a statistically significant level. Across Savelugu municipality, the schools supported by Savana Signatures showed consistent progress in absolute numbers of students passing the BECE (69 students in 2012, 73 students in 2013, 103 students in 2014), while other schools in the municipality fluctuated significantly from year to year (279 students in 2012, 113 students in 2013, 320 students in 2014).

An additional reason why it is difficult to make confident assertions from the data is because the number of students sitting the exam and passing the exam fluctuates significantly from year to year. Indeed, there are multiple inputs into the system which make determining causality very difficult. Despite the inconsistent data, and uncertain causation, there is a correlation between ICT use in the C4C schools and improved performance. It is likely that the programme has provided a positive contribution to the change taking place. It is also notable that programme schools feature among top prize-winners in local and regional ICT competitions (Darul Hardis and Yilonayili). While this does focus on the ICT skills of a few standout students, the role of these competitions in raising community awareness and enhancing school pride and student motivation was emphasised

by head teachers and teachers.

5. Conclusions

The analysis of interviews with teachers and head teachers in the five schools supported by IICD and Edukans demonstrates that the ICT inputs and training provided by the programme have contributed to a positive impact on ICT use in school management, teacher confidence and capacity.

There has been an improvement in learning outcomes over the course of the programme. There is strong anecdotal evidence that the participating schools have improved their pass rates since the programme started. However it is not yet possible to be confident in attributing this change to only the inputs of the programme. Learning outcomes have improved in the schools which have received the ICT training inputs which IICD supported. Yet the presence of schools (such as Savelugu Experimental) which do not use any ICTs, are not part of the C4C programme, and consistently have the highest pass rates, suggest that there are multiple contributing factors. Additionally, the inconsistency of results suggests that the testing process itself may well not be a reliable measure of assessing learning outcomes.

IICD and Edukans have played a central role in supporting Savana Signatures. This is through financial support, training, mentorship and technical expertise. Additionally, their support in the initial phase of the programme has led Savana Signatures to extend the programme to 13 other schools in the province. The success of their engagement with the five schools which are part of the partnership led Savana Signatures to seek funding from elsewhere to extend the project. This model has built the capacity of Savana Signatures, and broadened their impact in the region.

The increased confidence that teachers reported, not only in using ICT for their work as teachers, but also in their general self-confidence and motivation as teachers was cited as a key factor in improved teaching. The quantitative data indicates that teachers are significantly more confident in their use of ICTs both inside and outside the classroom as a result of the programme. In addition the teachers and head teachers both cited that the ICT training was a confidence boost for teachers, and provided greater motivation in their work. In addition to this, teachers cited an increase in student engagement, partly represented by better attendance, but also by their perception of students paying more attention in class. Explicit links by teachers and head teachers between these two and the improved test scores in BECE exams confirms their perception that ICT is contributing to improved learning outcomes.

6. Recommendations

Summary

The primary recommendation building from the conclusions is the choice between two possible directions for the future of the programme. The analysis has shown that ICT in the schools, implemented with fidelity as in the programme, can lead to increased teacher capacity, and student motivation for and engagement with school. However, substantial and sustained improvement in learning outcomes is likely to require on-going, in-depth inputs over several years

as part of a comprehensive educational change process. As a result, future involvement should either focus on basic training in a large number of schools with poor attainment, or more sustained and in-depth engagement with a small number of schools. Each of these is outlined in more detail below.

Recommendations for broader impact

The partnership between IICD and Edukans, Savana Signatures and the schools in the region has been characterised by ongoing commitment to the schools and their teachers. The level of training and ongoing support goes far beyond the well-trodden path of hardware-focused device distribution. Yet the gains which have been made in learning outcomes can not yet be accurately measured, or definitively attributed to ICTs. Indeed, any basic teacher training inputs (whether ICT related or not), which enhance confidence and improve teaching are likely to have an influential role on educational attainment. In light of this, adopting the following recommendations is likely to achieve a broader impact across the province:

- Spread the impact of basic inputs to a wider range of schools across the province
- Recognise that the emphasis on the detail of the ICT is less significant than the resulting overall enhanced confidence and improved teaching
- Structure the programme to enable on-going investment in ICT hardware
- Prioritise training across the programme
- Commit to regular on-going visits to the programme schools to monitor the progress being made and motivate the teachers

Recommendations for deeper impact

Alongside broadening impact, it is worth considering if it would be more appropriate to focus on deepening the impact in the schools already participating in the programme. Consolidating and advancing any initial improvements in learning outcomes will undoubtedly require a greater concentration of inputs. If the progress is to be sustained it will be necessary to continue to engage for the long-term: the programme schools are not yet close to being self-sufficient in their use of ICT. The findings of this research suggest the following recommendations to achieve a deeper impact with the schools already engaged in the programme:

- Have intensive, sustained and widespread training on ICT pedagogy
- Begin to build school-to-school networks within the participating schools to promote more integrated use of ICT
- Take positive steps to introduce the SMIS as the next stage of using ICT to improve school management – and do this in a way that is contextualised appropriately for the context
- Decide an approach to the on-going inputs of technology into the schools so that the capacity to use ICT is sustained rather than gradually reducing as the present hardware ages.