Zimbabwe Digital Schools

Phase 2 Interim Report
November 2019

Introduction

The Zimbabwe Digital Schools project now in its second phase is working to strengthen outcomes among teachers, students and 10 schools in Harare through computer laboratories setup at each school in Phase 1, and capacity building that has been taking place ever since. Phase 2 focuses on increasing ICT infrastructure at schools, further teacher training, assessment and certification in ICDL modules, and testing students in the Digital Citizen Plus module in order to demonstrate their competence in basic ICT.

Further laptops have been sent to all schools so that more teachers can benefit from ICT. In the coming weeks 1,000 students across the 10 schools will be tested in the Digital Citizen Plus ICDL module; this is an introductory ICDL module normally taken prior to ICDL base modules. This testing will occur with students approaching their final Grade of Primary school (Grade 6) since these students have the greatest exposure to computers and in theory should be the most skilled students at the school.

Baseline monitoring surveys were completed in April 2019 with principals, teachers, and students. The results from these surveys will be discussed in this report.

A lesson in the computer lab at Glen Norah 7 Primary School

Output Progression

Baseline Survey

Activities for Phase 2 of the project began in early 2019 with the Baseline survey to principals, teachers and students at the 10 schools and also Mbizi Primary School which has benefited from the project. In Phase 2, the purpose of the baseline survey was to gauge changes particularly in the access and usage of the computer labs at the schools. The baseline was conducted exactly one year after the Phase 1 endline, so there was a good period of time for change. The Phase 2 student baseline for Zimbabwe was also the largest sample size in a Computer Aid project, with 423 students completing the survey.

Preparation of Further Equipment

A range of further equipment for the schools was prepared including 30 laptops (3 extra per school) , 30 projectors (3 per school) to be used by ICDL trained teachers and specialised eye tracking hardware and software to be used at St. Giles Special School. The purpose of this further equipment was to increase the amount of classrooms in the schools that can benefit from ICT (through these laptops and projectors being delivered) and also to ensure that the 3 trained teachers from each school had the appropriate resources in their classroom to use their new computing skills.

Equipment Shipping & Delivery

The equipment was shipped to Zimbabwe in September 2019 and was received in Harare in October 2019. Delivery of the laptops, projectors and specialised equipment to the schools began in the second week of October, once the equipment was released from customs.

Further Teacher ICDL Training

The teacher training resumed in late August 2019. The teachers who took the Digital Citizen module or had failed ICDL Base modules in Phase 1 would begin training in the ICDL Base modules . Teachers who had completed the 4 base modules in Phase 1 would take the Computing module. The more basic group consisted of 14 teachers, whilst the more advanced group also consisted of 14 teachers. The updated ICDL results will be presented at the end of the outcomes section. A further point to note is that Mukurumbira Primary School have now employed an ICT teacher as a result of the project and lab installation.

A lesson in the computer lab at Seke 1 High School

Timeline Adjustments

There have been a few changes to the original project timeline:

- The processing and shipping of equipment to Zimbabwe took place in September 2019 rather than June 2019.

- As such, equipment was released in October 2019 in Harare with installations taking place at schools in 2nd week of October.

- The in-country visit will take place in November 2019, so that Computer Aid staff can be present for the student Digital Citizen testing that will occur across the schools.

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	PROJECT TIMELINE - ZIMBABWE DIGITAL SCHOOLS								
	Mar-19	Apr-19	Aug-19	Sep-19	Oct-19	Nov-19	Mar-20	Apr-20	May-20
COMPUTER AID INTERNATIONAL									
Baseline Monitoring	Baseline Surveys								
Processing and shipping laptops and buying additional equipment									
Shipping and custom clearance									
In-country visit to Zimbabwe for Digital Citizen test (1,000 students)						Visit			
Interim Report						I. R			
Endline Monitoring							Endline Surveys		
Final Report									F. R
WORLD LINKS & ICDL									
Laptop and equipment deployment									
ICDL Training of Teachers									

Interim Outcomes

The baseline survey was conducted between March and April 2019 in collaboration with the Computer Society of Zimbabwe (CSZ), who oversaw the process in-country. With CSZ's support, we were able to obtain a much larger sample size for the student survey (423 responses), in addition to responses from 11 principals (including Mbizi Primary School) and 28 of the ICDL trained teachers. To put this in perspective, the Phase 1 baseline and endline surveys were completed by 50 students in total (5 students from each school).

The surveys were all completed online in the computer labs. Certain schools don't have reliable connectivity, so it was slightly more challenging to collect the data, however, the use of a mobile hotspot and internet dongles allowed for the collection of data from all schools.. Thankfully, the larger time-frame allowed for more responses.

Principal Survey

The principal survey was completed between 20th March and 3rd April. As mentioned, all 10 schools completed the survey as did Mbizi Primary School, which is not one of the project schools but did receive some equipment and 3 of their teachers were trained in ICDL modules.

Many of the responses around ICT lab access from the schools indicate that all Primary Grades (1-7) and Early Childhood Development (ECD) 1 & 2 are accessing the computer lab weekly for equal periods of time. Mutasa Primary school was the only exception, providing 30 mins in the lab to ECD, and 1 hour to Grades 1-7.

Kamungeramu Zvidzai, *Principal at Sunningdale 2 Primary School*

"We have been using the computer lab for teaching learners to transform data into information using a computer to help with their studies and to transform teachers teaching process for effective communication with learners and record keeping."

When asked if the computer lab is being used for other subjects too, there were a mix of responses. Hatcliffe 1 Primary School mentioned that only Grade 7 access the lab for other subjects. Other schools such as Glen Norah 7 Primary School and Seke 1 High School mainly use the lab for computer studies.

Other schools such as Mbizi mentioned that only ICDL trained teachers use the computer lab for lessons. Of the schools that have incorporated other subjects into the computer lab, Science, Maths and English were the most common responses. All schools mentioned that they are keen to extend ICT literacy to other teachers and to have further capacity building.

In terms of outcomes, principals mentioned that ICT enrolment has increased and that pass rates have increased in subjects which utilise the lab. However, there are still challenges to accommodate the computer lab to the huge student cohorts the schools have.

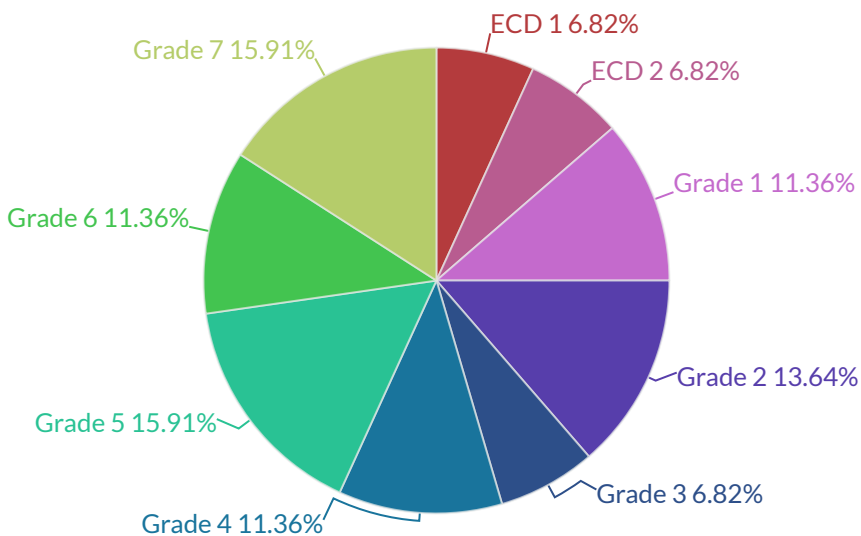
73% (8/11) of school principals mentioned that the amount of graduates from their school has risen since the installation of the lab, though they also mentioned that they have been increasing staff numbers to accommodate with the increases in students.

Teacher Survey

28 of the 33 trained teachers completed the Stage 2 baseline survey. Chart 1 (C1) below shows which grades teachers teach, split for Primary and Secondary level.

C1. Teacher Grade Breakdown

Primary | Secondary

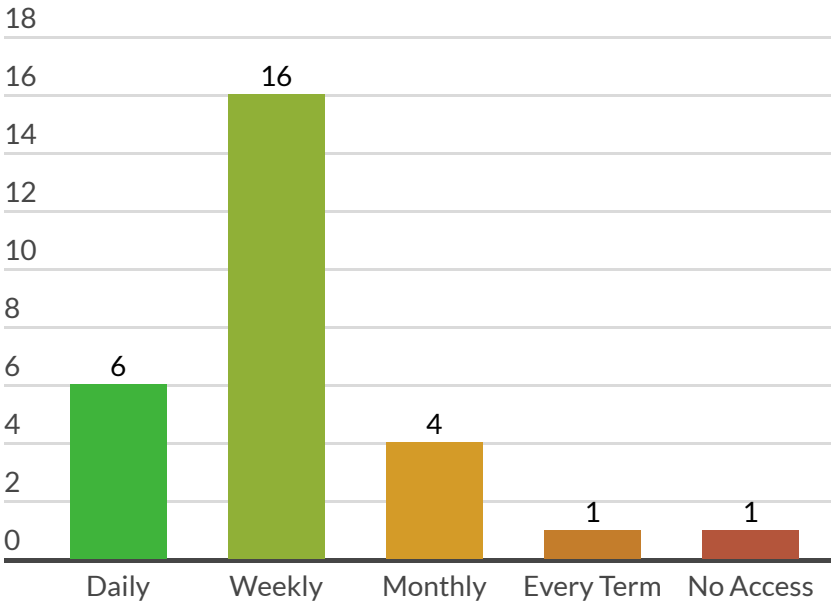


C1 indicates that there is a wide-range of grades taught by the ICDL trained teachers at Primary Schools. For Seke 1 Secondary School, the teachers tend to teach the older grades at Secondary level.

Teachers teach an average of 171 students per week across all 11 schools, with the highest student figure being at Hatcliffe and the lowest student figure being at St. Giles Special School.

According to teachers, most of them use the lab weekly as part of their teaching. Chart 2 (C2) below shows the breakdown of computer lab access for teachers.

C2. Teacher Lab Access



With the exception of a few teachers, **79%** of teachers access their respective computer labs daily or weekly for teaching. When teachers are accessing the computer lab for teaching, **82%** teach for 30-60 minutes. Only teachers at Seke 1 High School teach for longer (usually double periods totalling 70 minutes). Overall, most teachers are teaching in the lab for 1-2 hours per week

Magumise Nancy, Teacher *at Glen Norah 7 Primary School*

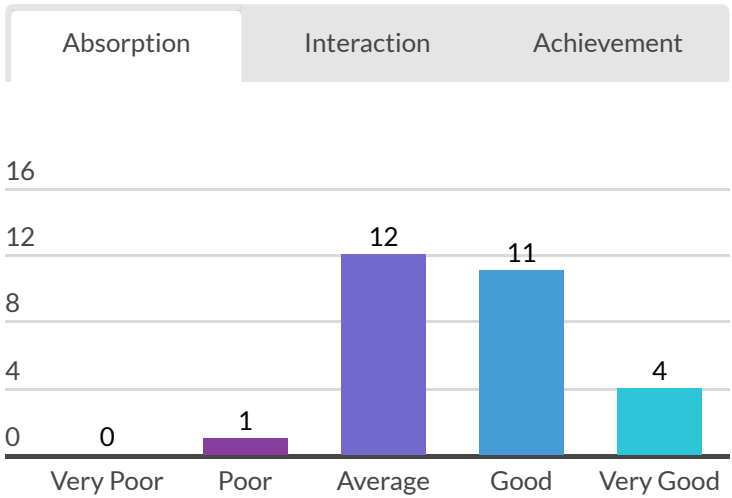
"I have been able to use the projector to show pupils images. I have used the printer to print documents to use. I have also been researching for all lessons to be taught."

Masukaruka Miidzo, Teacher *at Kudzanayi Primary School*

"I can now use the projector during lessons, showing educational videos, I also can now create lesson plans and print documents e.g. mark schedules."

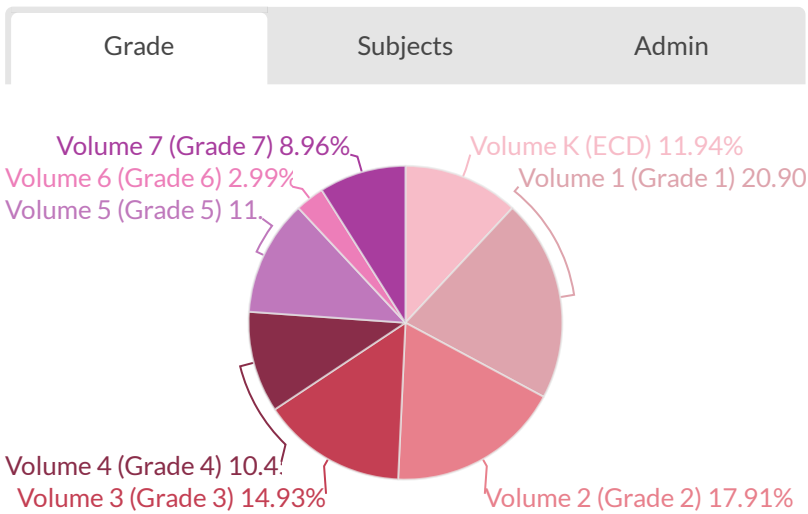
Chart 3 (C3) below shows teacher ratings for student absorption, interaction and achievement in the computer lab. Across all school, most teachers indicate that levels for students are average to very good.

C3. Student Lab Ratings



In terms of content usage, teachers indicated that they use a range of digital content as part of their classes. These include e-Learner, Encarta, Khan Academy videos, and creating PowerPoint presentations. Additionally, the computers are being used for teachers to conduct research and create lesson plans. The projectors are being well-utilised as a means of projecting the content to the class and 7 schools are actively using their Connect Device. **96%** of teachers feel that the ICDL training has been useful to what they've explored in classes within the computer lab. All teachers utilising the lab are accessing the e-Learner platform and **75%** of teachers rated the content within e-Learner as 'Useful' and 'Very Useful.' Chart 4 (C4) below shows which content from the e-Learner platform has been accessed by the teachers.

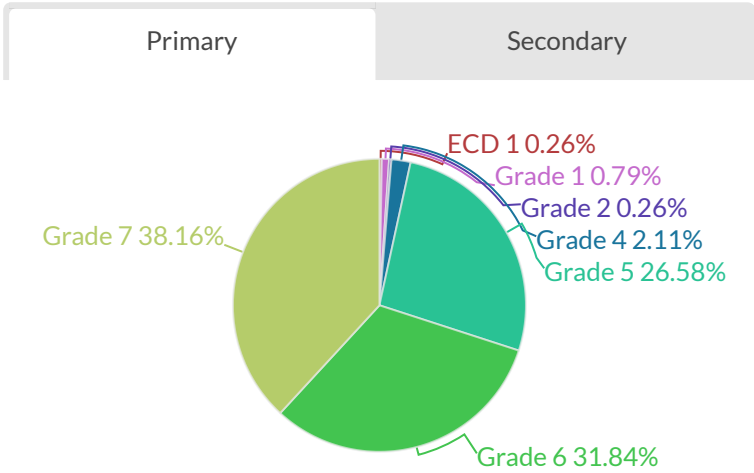
C4. e-Learner Usage



Student Survey

The student survey was completed by 423 students across 11 schools, with an average of 42 students completing at each school (other than St. Giles). C5 below shows the breakdown of grades for students who completed the survey.

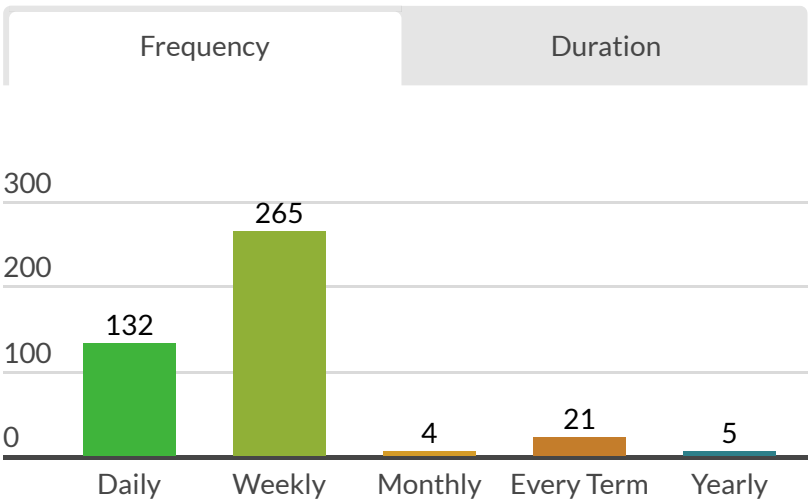
C5. Student Survey Grade Breakdown



Most students who completed the survey were in the eldest grades from both Primary and Secondary school; **97%** of students from Primary School were in Grade 5-7; **88%** of Secondary school students (Seke 1) who completed the survey were in Form 5, the eldest grade. Of the 423 students who completed the survey, **324 (77%)** first accessed a computer as part of the project.

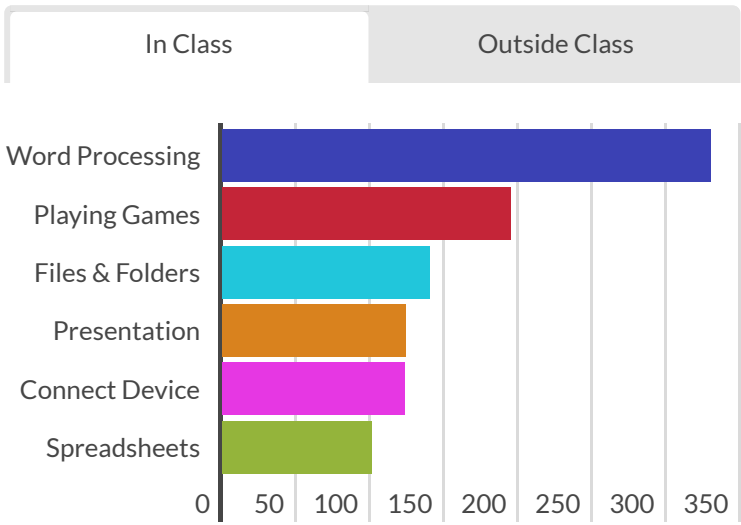
C6 below shows computer lab access for students outside of class. Most students are accessing the computer lab outside of class weekly (**63%**), and mostly for less than 30 minutes (**47%**).

C6. Student Lab Access - Outside Of Class



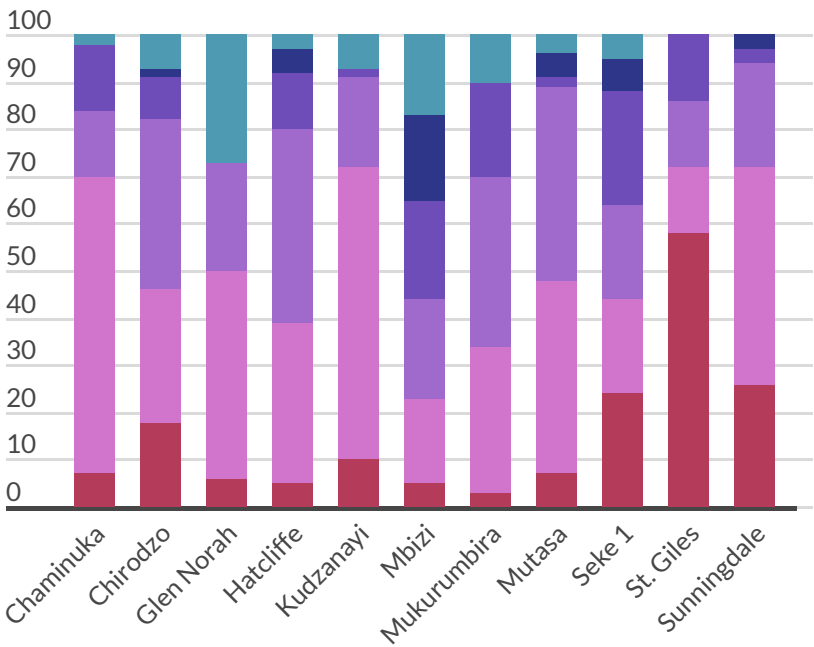
C7 below shows student usage and which types of tasks students are completing on the computers, during class and outside of class. Unsurprisingly, playing games increases outside of class.

C7. Student Lab Usage



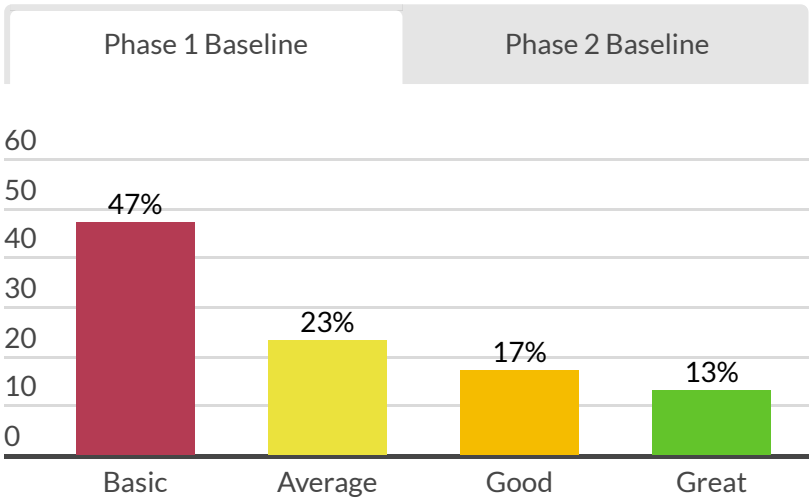
C8 below indicates what the computer to student ratio is within classes. Students were asked how many classmates they share a computer with, during a typical lesson in the computer lab. The chart indicates that at most schools, most students (**67%**) are sharing a computer with 1 or 2 classmates in the computer lab. Mbizi and Hatcliffe have the worst student to computer ratios, whilst Mutasa and Glen Norah 7 have the best ratios.

C8. Student-to-Computer Ratio in Class



C9 below indicates students' overall ranking with computers at the time of the Phase 2 baseline in April 2019, but also compares to the same question in the Phase 1 baseline (May 2017). Given that the sample sizes are different in both surveys, we will look at the percentage of respondents who categorise themselves in various categories and compare to see if there has been any improvement.

C9. Student Ability Comparison



The results from C9 indicate that there has been a substantial improvement in the way students rate their abilities across the 10 schools. Whilst **47%** of students surveyed in the Phase 1 baseline felt their computer skills were 'Basic', in Phase 2 that number has dropped to **16%**. Additionally, **51%** of students surveyed in Phase 2 feel that they have 'Good' computer skills. It should be noted that these results are somewhat subjective, however, observing this clear shift in results across the 10 schools is promising.

When students were asked to rank their classmates ability with ICT, the results largely mirrored C9 (Phase 2 Baseline), with most students feeling their classmates had 'Good' ICT skills. There was almost an even split (**45%**) of students feeling they had superior ICT skills compared their classmates and those (**55%**) who felt they had inferior ICT skills compared to their classmates.

Hazel Makombe, Student *at Seke 1 High School*

"The computers have affected me positively because it gives me access to the internet which I have used to research information about my Geography class."

Anesuishe Chimbalu, Student *at Mukurumbira Primary School*

"Since the computers came to our school they have being helping me through research for school tests."

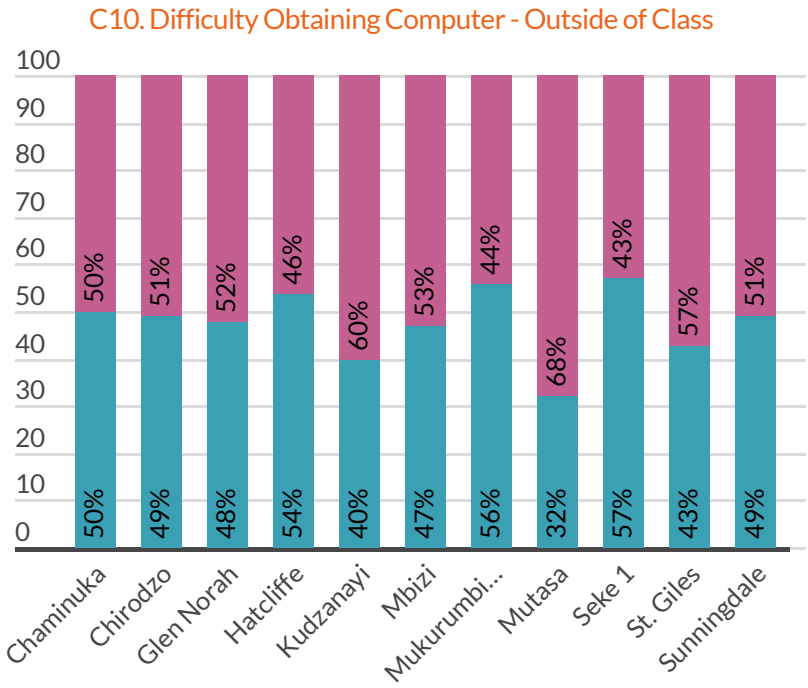
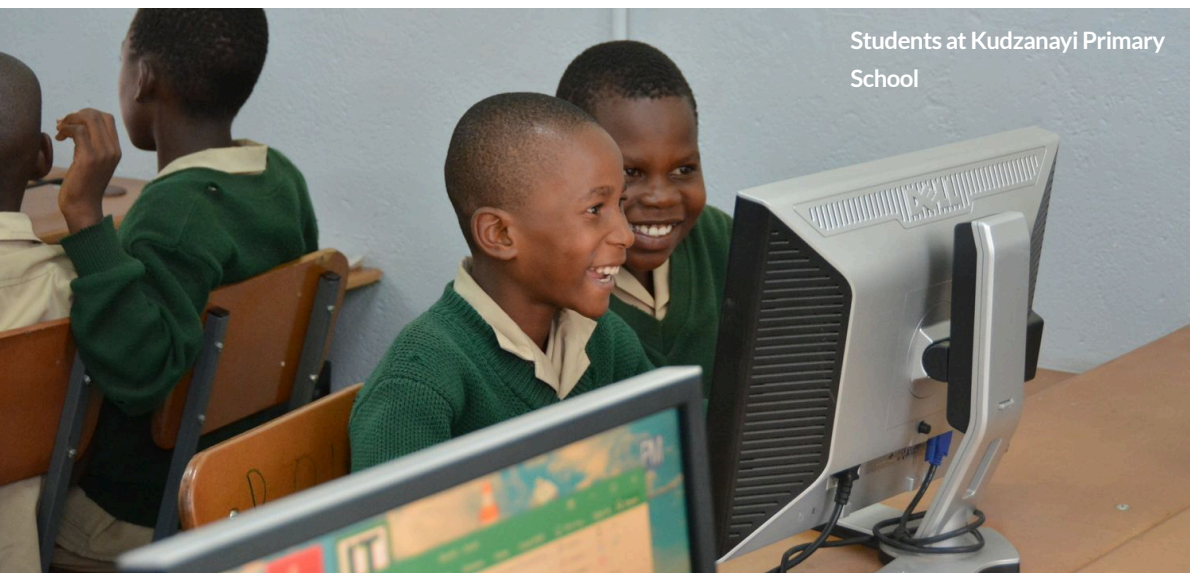


Chart 10 on page 12 indicates how difficult it is to access a computer outside of class, according to the students. The chart is also broken down by school in order to see which schools suffer most from this issue. Most schools have a mix of responses, however Mutasa was the most promising, with almost 70% of students stating they don't have an issue accessing a computer outside of class. Mutasa also had promising results in C8 which complement these results.

Students expressed difficulty accessing a computer outside class at schools with smaller computer labs and/or larger student cohorts such as Seke 1 and Hatliffe.



Students at Kudzanayi Primary School

Further Quotes From Students:

"I come to the computer lab during my free periods to read or code."

"I can search for information I don't know about."

"I began programming thanks to the computer lab."

"Sometimes I go home late as I want to continue using the computers"

"My favourite time in the computer lab was giving a presentation to fellow students."

"Lessons in the computer lab are much funner."

"I like listening to music on the computers."

"My favourite memory in the lab was when we learnt about world religions.."

"I have learned to type because of my lessons with the computers."

"My favourite time in the computer lab was when we learnt about the earth and sun in science."

"I wrote an application letter in the computer lab."

"My favourite memory in the lab was learning about the history of ZImbabwe."

Principal, teachers and students receive new laptops and projectors at Chirodzo Primary School

Interim ICDL Results

The table below shows the results for all ICDL assessments taken in Phase 2 of the project. The more advanced group of teachers were assessed in Computing, whilst the more basic group who had previously taken Digital Citizen in Phase 1 were assessed in Computer Essentials and Word Processing.

MODULE	NUMBER OF PASSES	NUMBER OF FAILS	HIGHEST SCORE	AVERAGE SCORE
Computing	12	2	94	85
Computer Essentials	1	13	100	50
Word	1	13	81	38

The results indicate that the Computing group have almost all been certified in that module which seeks to implement the use of computational thinking and coding in order to create simple computer programs.

In contrast, the more basic group of teacher have struggled to pass assessment in Computer Essentials and Word Processing. It should be noted that the teachers in the basic group tend to be older and have found it harder to grasp content in training. The group is a mix of teachers who took Digital Citizen or who had failed their ICDL base modules in Phase 1.

Teachers who have been certified in the ICDL Computing module

Overall ICDL Results

The table below shows the results for all ICDL assessments taken across both Phase 1 and 2, from a cohort of 34 teachers who have been assessed.

MODULE TYPE	MODULE	NUMBER OF PASSES	NUMBER OF FAILS	HIGHEST SCORE	AVERAGE SCORE
Base	Computer Essentials	19	15	100%	87%
Base	Word Processing	18	18	92%	82%
Base	Online Essentials	17	0	89%	83%
Base	Spreadsheets	16	6	94%	84%
Intermediate	ICT In Education	12	5	97%	86%
Intermediate	Computing	12	2	94%	85%

Teachers being trained in ICDL Computing module

SUSTAINABLE DEVELOPMENT GOALS

Quality Education

This project contributes to Target 4.4 of SDG 4 which states:
By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.

Both teachers and students at project schools are directly gaining and have the opportunity to gain relevant technical skills that will improve their job prospects, contributing to Target 4.4.

Gender Equality

This project contributes to Target 5.B of SDG 5 which states:
Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women.

By working exclusively with schools with similar ratios of boys to girls and in some cases having more female students, usage of equipment by both genders ensures that no individual is excluded.

Industry, Innovation And Infrastructure

This project contributes to Target 9.C of SDG 9 which states:
Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020.

By providing 10 schools with computer labs and assistive technology such as projectors, thousands of students have access information and communications technology.

Responsible Consumption And Production

This project contributes to Target 12.5 of SDG 12 which states:
By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.

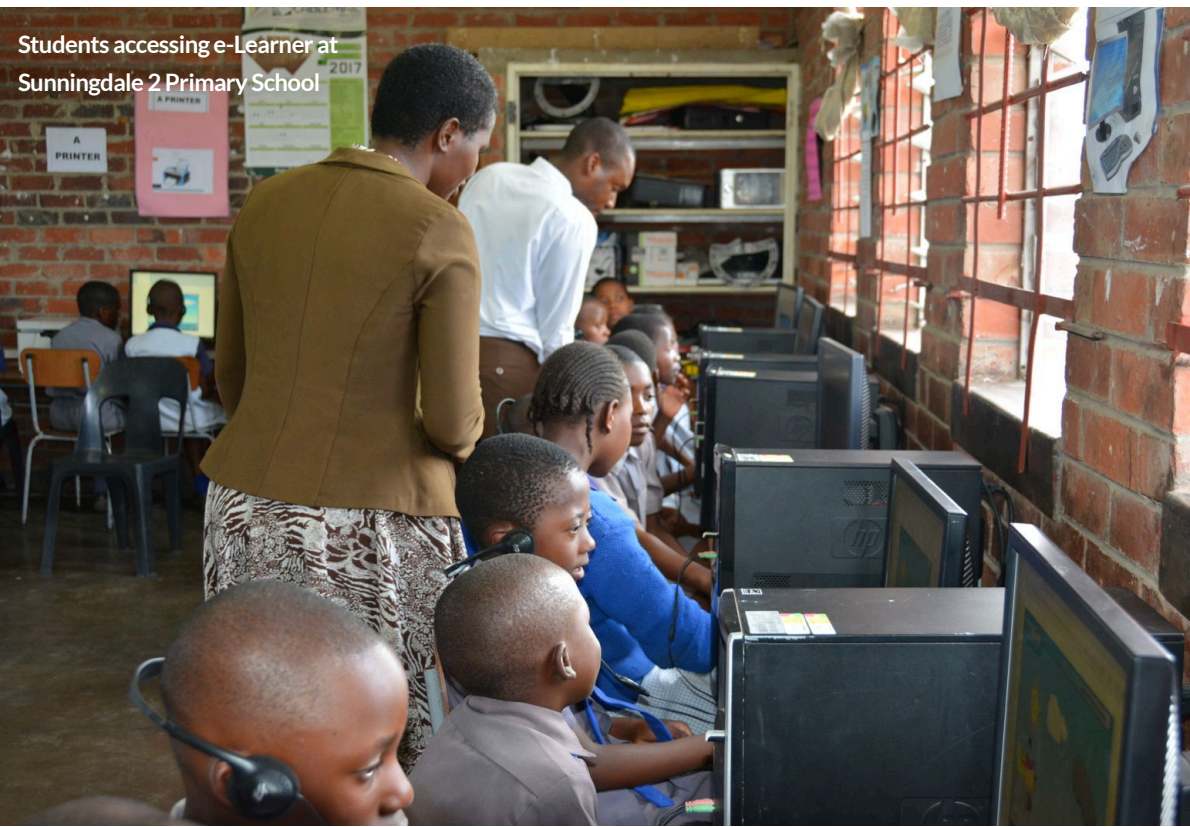
ICT Equipment used in projects is donated largely from companies; equipment is data-wiped and refurbished before being sent to projects. Therefore, this project is promoting the reuse of equipment and reducing e-waste.

Next Steps

The project has delivered a number of outputs in Phase 2, however, further outputs and outcomes are expected particularly in regards to the teacher ICDL training. The results among the basic ICT group have been poor and teachers in this group require far more support and time in order to better understand the topics and content they're covering.

As such, ICDL teacher training will continue in the coming weekends in Computer Essentials and Word Processing, so that teachers in this group can retake assessment thereafter. and hopefully become certified in these modules.

Another significant next step is that one thousand students across the 10 schools will be tested in Digital Citizen Plus in November. These will be students from Grade 6, who should have had adequate exposure to the computer lab and lessons with trained teachers. The results from this mass assessment will be presented in the final report in May 2020.



Students accessing e-Learner at Sunningdale 2 Primary School

Summary

In summary, the delivery of further equipment will allow the schools to more-widely benefit from ICT by adding projectors to other classrooms.. Additionally, baseline surveys and recent ICDL results of teacher training in Phase 2 of the project have provided some useful insight into the outcomes of the project.

One of the most striking figures is that **77%** of students who completed the survey accessed a computer for the first time at school, as a result of the project. In addition, most teachers and students are accessing the labs weekly. Content is being accessed from the e-Learner package, Encarta, and Microsoft Office is being utilised (particularly Word). The labs are generally used by teachers for 1 period (30 mins) for younger children in ECD and 2 periods (60 mins) for students in Grade 1-7. Schools are still focusing heavily on Computer Studies, but certain schools are also using the lab for Maths, Science, English and other subjects within the e-Learner platform. At most schools, students are sharing computers in class with 1-2 classmates, though some schools have higher student cohorts and therefore a greater number of students per computer.

Looking forward, teacher training will resume on weekends, focusing on Computer Essentials and Word Processing. Teachers will be reassessed in the modules once they have undertaken adequate training. Students will be tested in the Digital Citizen Plus module in November; this process will provide insight into levels of student ICT literacy across the 10 schools.

A female student accessing Zimbabwean content on e-Learner at Mukurumbira Primary School