Kenya Digital Schools

Phase 3 Final Report
December 2023

Introduction

The Kenya Digital Schools project has been working to improve teacher, student and educational outcomes at 10 Secondary schools across Naivasha, Kenya. In Phase 1, fully functioning computer labs were setup at each school with 20 PCs each, and 3 teachers per school were trained in up to 6 ICDL modules. In Phase 2, further ICDL training occurred in advanced ICDL modules for some teachers, including Cybersecurity, Financial Spreadsheets, and Management Spreadsheets.

Most recently in Phase 3, 459 students (from Secondary Form 1 - Form 3) across the 10 schools were tested and certified in the ICDL Computer & Online Essentials module, resulting in 429 passes in total.

2023 Calendar Changes

In the years since 2020, Kenyan schools were working to catch-up on the school curriculum after the disruption caused by the pandemic. As such, the school terms were extended, with shorter holidays between terms. However, in 2023 the school year was shortened back to its original length with 3 school terms lasting 3 months each. The academic year starts in January and ends by December.

This reversion of the school calendar led to disruption in the project activities since students were preparing for the national examinations being run in November 2023. As such, no student endline (which had been run in November in previous years) was run in Phase 3 and ICDL testing of students was not completed due to the disruption caused by the preparation for the national exams in October and November 2023.

In total, there were 555 student ICDL assessments, and we plan to run the remaining 450 tests in 2024.

Project Summary

Year 1 - 2021

In Year 1, schools were supplied with ICT equipment and computer labs started being installed in July 2021. Prior to this in late 2020, teachers were trained online (due to the pandemic restrictions) in 6 ICDL modules including Computer Essentials, Online Essentials, Documents, Spreadsheets, Presentations, and ICT in Education.

Year 2 - 2022

In Year 2, there was further ICDL training, assessment and certification in advanced ICDL modules for teachers. Only teachers who performed well in Phase 1 assessments were selected due to the challenging nature of the modules. This occurred between September and October 2022. Students gained increased access and usage of their computer labs in classes, strengthening their confidence with the hardware and software.

Year 3 - 2023

In the final year of the project, around 45 students per school between Secondary Forms 1-3 were selected for ICDL assessment. The purpose of this testing was to understand levels of ICT literacy among the students at the schools. It also allowed students to gain internationally recognised certification, providing them with a competitive advantage in their educational and career prospects over their peers in Naivasha.

School Summary

Archbishop Ndingi Secondary School

Archbishop Ndingi is a boys secondary school located in Naivasha with 200-300 students. Teachers had very basic exposure to ICT before the project. They wanted to allow students to start using ICT.

Enaiposha Girls High School

Enaiposha is a girls secondary school in Naivasha with 400-500 students. They were keen to be fully compliant with the Kenyan IT curriculum and their students had no prior access to ICT equipment.

Magereza Academy

Magereza is a boys secondary school in Naivasha with 350-400 students. They were also keen to have a computer lab given that ICT was going to be part of the secondary school curriculum.

Milimani High School

Milimani is a larger mixed secondary school with a cohort of over 1,500 students. Prior to the project, most of their students had never accessed ICT equipment.

Mirera High School

Mirera is another mixed secondary school with a large cohort of over 1,160 students. The school was keen to increase the exposure of ICT to their students and around 45 staff members.

Naivasha Mixed Secondary School

Naivasha Mixed is a secondary school with around 450-500 male and female students. Their aim was to equip all school leavers with ICT skills.

Nyakairu Senior Secondary School

Nyakairu is a mixed secondary school in Naivasha with a school cohort of around 250-300 students. Their goal was to improve teacher ICT knowledge and make their students more competitive in the job market with good ICT skills.

Nyonjoro Secondary School

Nyonjoro is a mixed secondary school in Naivasha with a cohort of 350-450 students. Their teachers had basic ICT skills before the project, but wanted to integrate all subject teaching through computers and ICT.

North Karati Secondary School

North Karati is a smaller mixed secondary school with around 200 students, most of whom are female. They aimed to increase ICT exposure to their 20 teaching staff and improve student ICT skills.

Naivasha Day Secondary School

Naivasha Day is a larger mixed secondary school in Naivasha with a cohort of over 1,460 students, and 44 teaching staff. They were keen to integrate the Kenyan ICT curriculum into their student learning.

Teacher Outcomes

A summary of the key data from the teacher surveys across all 3 phases is presented below. Chart 1 shows that by Phase 3, there is quite an even split among Form 1-4, though 79% of teachers teach Form 3 (16-18 year olds). Chart 2 indicates that in Phase 3, most teachers teach Computer Studies, Maths, or Science. Many teachers teach numerous subjects including Maths and Science.

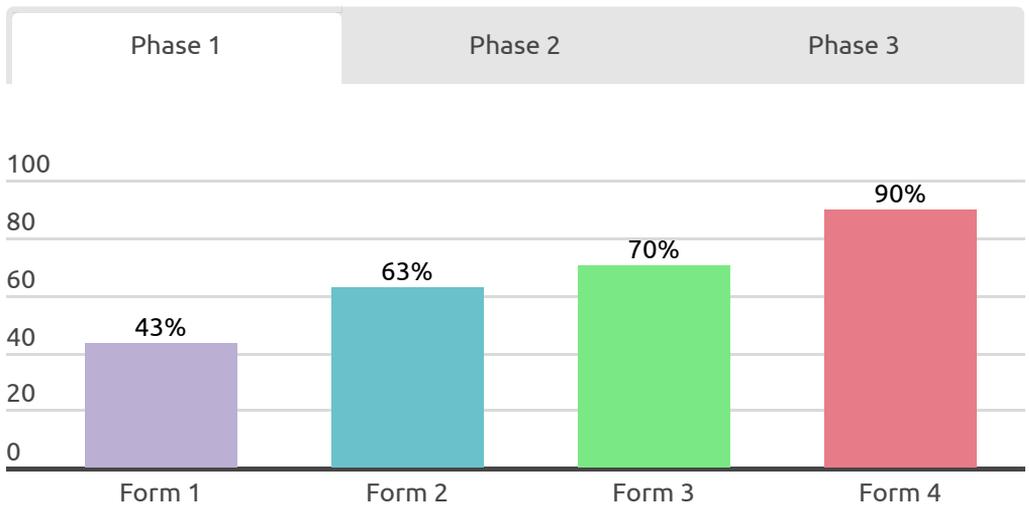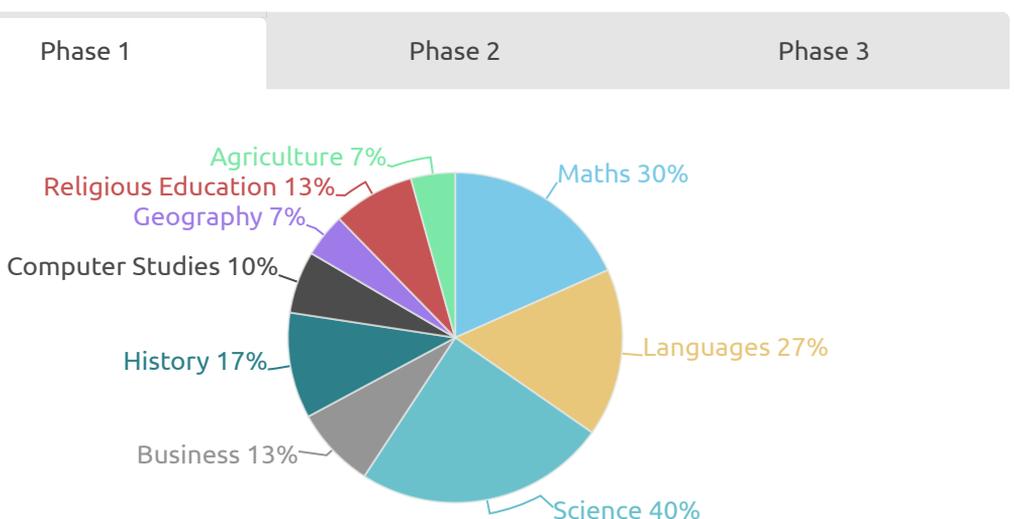## Chart 1: Student Grades Taught By Teachers

Phase 1	Phase 2	Phase 3

- 100
- 80
- 60
- 40
- 20
- 0

43% 63% 70% 90%

Form 1   Form 2   Form 3   Form 4

Chart 2: Teacher Subjects

Phase 1	Phase 2	Phase 3

Agriculture 7%
Religious Education 13%
Geography 7%
Computer Studies 10%
History 17%
Business 13%
Maths 30%
Languages 27%
Science 40%

Josephine Wanjiku Gicheha Teaches Maths and Chemistry to Form 3 *at Mirera High School*

"I have been able to prepare ICT integrated lessons and expose digital content to my learners, building my confidence in my teaching."

When teachers were asked how useful the ICDL training was overall, 93% of teachers responded 'Very Beneficial' with a quote below explaining why this was the case.

Stephen Gitau, Teaches Maths and Chemistry to all 4 grades at Naivasha Day Secondary School

"I was able to acquire skills in online training, spreadsheets and PowerPoint presentation. This is useful for my own skills and for my students"

Chart 3: Teacher ICT Skill Confidence

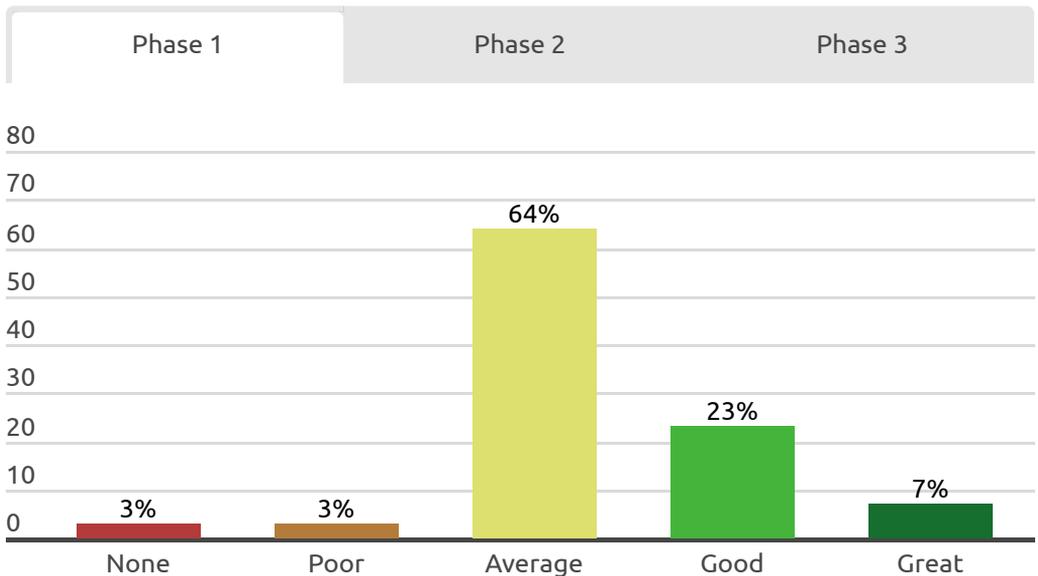| Phase 1	Phase 2	Phase 3

Chart 3 shows teacher confidence levels in ICT across all 3 phases. In Phase 1, most teachers (64%) categorised themselves as having 'Average' computers skills, whilst in Phase 2, 44% categorised themselves as having 'Great' computer skills.

In Phase 3, this has further improved with 53% of teachers stating that they have 'Great' ICT skills. This suggests that the ICDL training has improved teacher confidence.

Chart 4: Student Class Indicators

Absorption P1

- Very Weak: 3%
- Weak: 7%
- Average: 83%
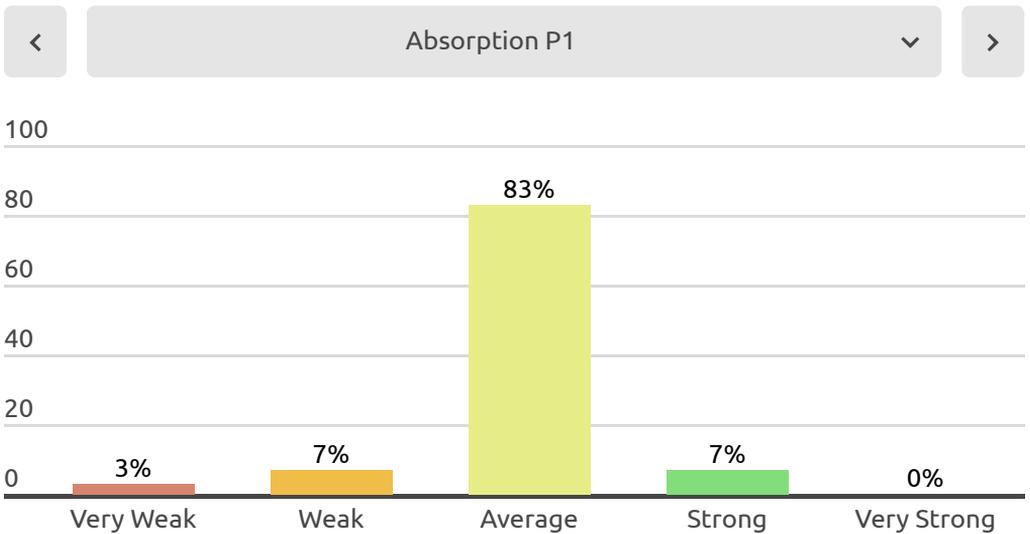- Strong: 7%
- Very Strong: 0%

Chart 4 indicates teacher ratings for various student indicators in classrooms across all 3 phases. All 3 indicators have improved between phase 1-3, with more teachers indicating that absorption, interaction and achievement are now stronger. 'Average' was still the most chosen option for Absorption (47%) and Achievement (40%), whilst Interaction is now mostly ranked (37%) as 'Very Strong.'

Chart 5 below show which types of assistive technology teachers have been accessing across the phases. In Phase 3, access to laptops has increased to 87% and access to projectors have increased to 100%.

Chart 5: Teacher Assistive Tech Access

Phase 1 | Phase 2 | Phase 3

- Laptop: 77%
- Internet: 70%
- Printer: 63%
- Projector: 50%
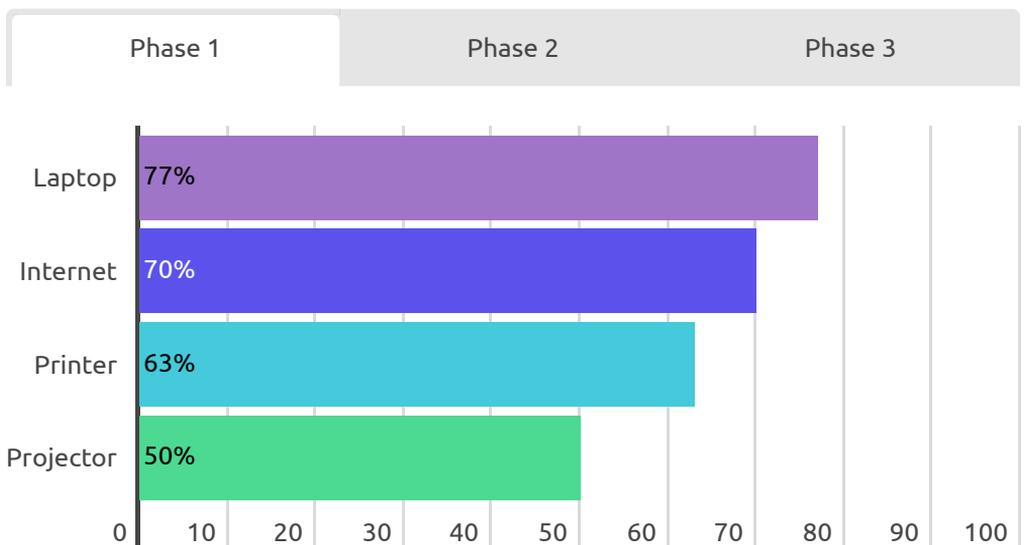
Student Outcomes

A summary of the key data from the student surveys between Phase 1 and 2 is presented below. Due to Kenyan secondary school examinations returning to being run in October and November 2023 for the first time since Covid, no student endline survey was run in Phase 3.

The students who completed surveys across Phase 1 & 2 form a fairly even mix across school grades, with most students in Secondary Form 1 (25%). Most students (46%) had first used a computer in their school computer lab between September and December 2021.

Chart 6 shows how often students have been accessing their computer labs both during class and outside of class in Phase 1 and 2. Most students completing the survey have been accessing the computer lab for classes Daily (63%). Outside of class, 36% of students have been accessing the computer lab Daily, whilst 28% don't access outside of class.
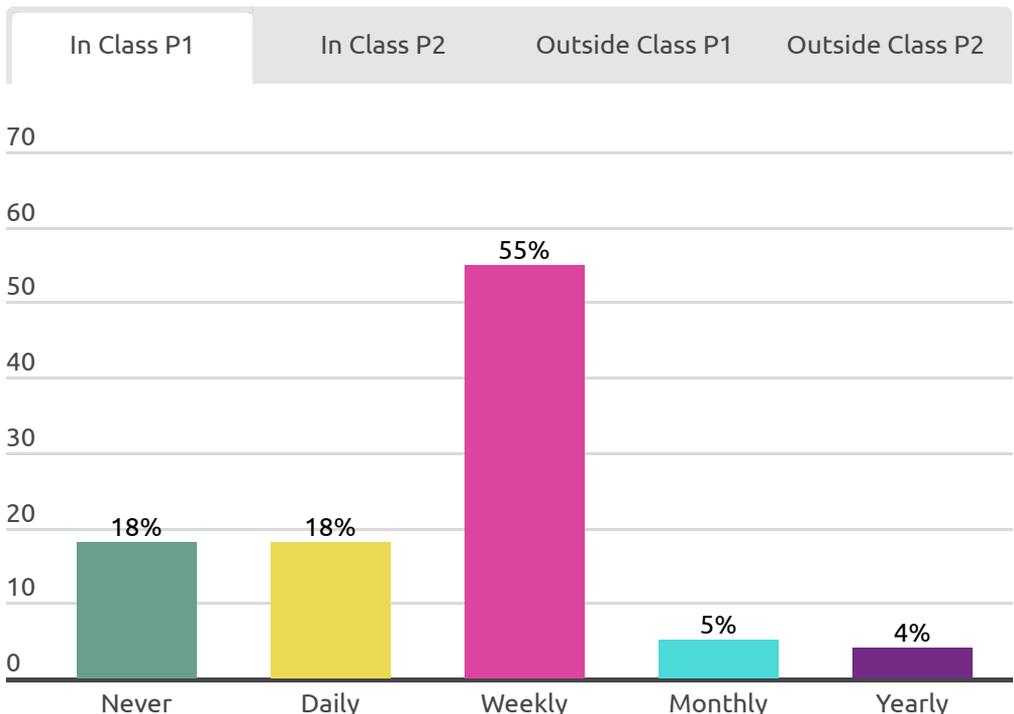
Chart 6: Student Lab Access

| In Class P1 | In Class P2 | Outside Class P1 | Outside Class P2 |

Chart 7: Duration Of Student Lab Access

In Class P1	In Class P2	Outside Class P1	Outside Class P2

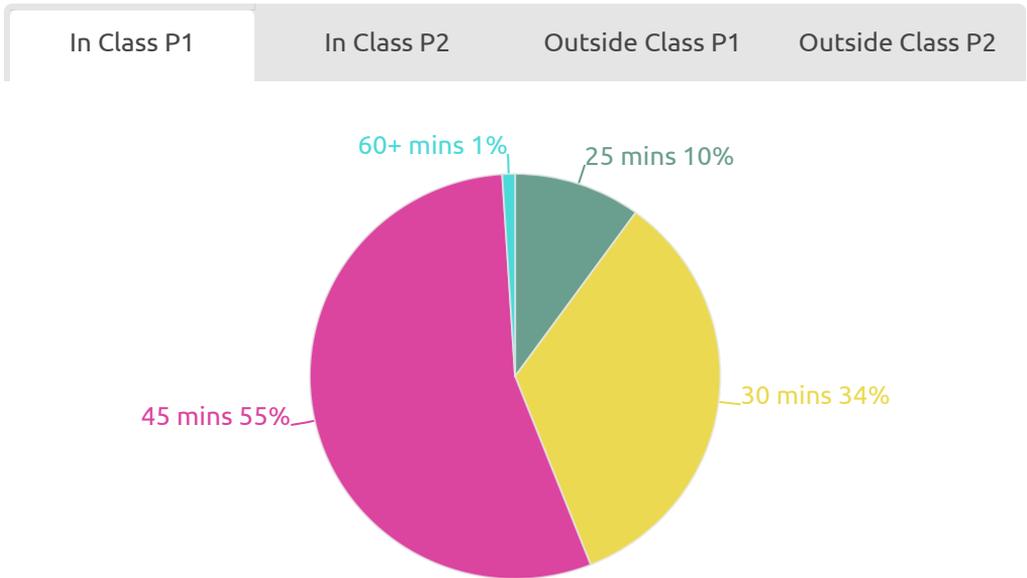60+ mins 1%   25 mins 10%

45 mins 55%   30 mins 34%

Chart 7 shows the duration of access for students both inside and outside of classes in Phase 1 and 2. In class, most students (65%) have been accessing the lab for 45 minutes. Outside of class, 68% of students are accessing the lab for 30-60 minutes. Both have increased from Phase 1 by over 10%.

Relating to activities in the computer lab, 90% of students have been using word processing software in classes and spreadsheet software such as Excel is also a popular in classes with 52% of respondents stating this. Across the schools, 81% of students have been able to use a machine on their own, whilst 13% share with one other classmate.

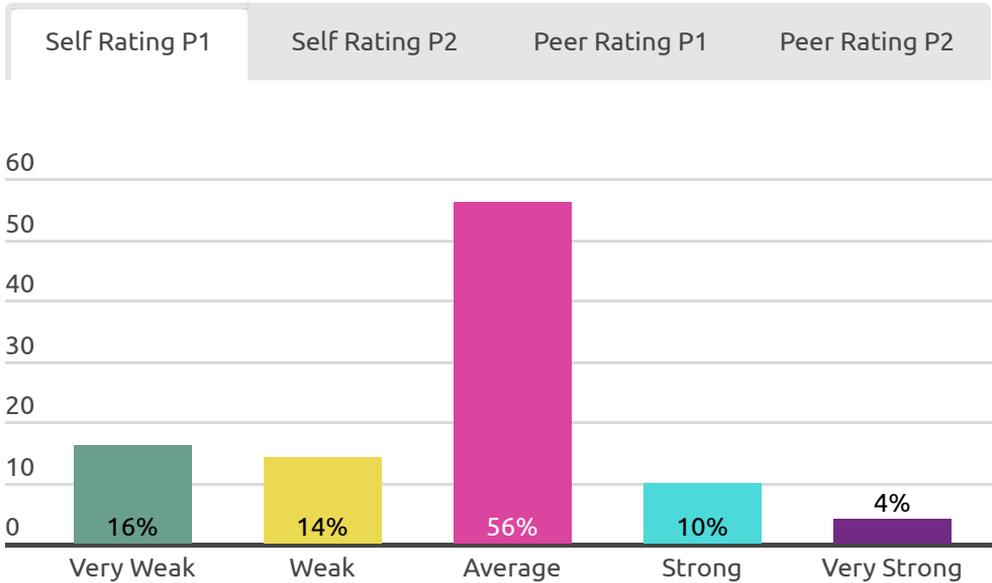**Victor Njoroge,** Form 3 Student *at Magereza Academy*

"The use of equipment has enhanced my overall computer skills in almost all the Microsoft applications"

Deborah Kaunda, Form 3 Student *at Enaiposha Girls High School*

"The project has enabled me to know more things about computer studies and other subjects and also how to type faster."
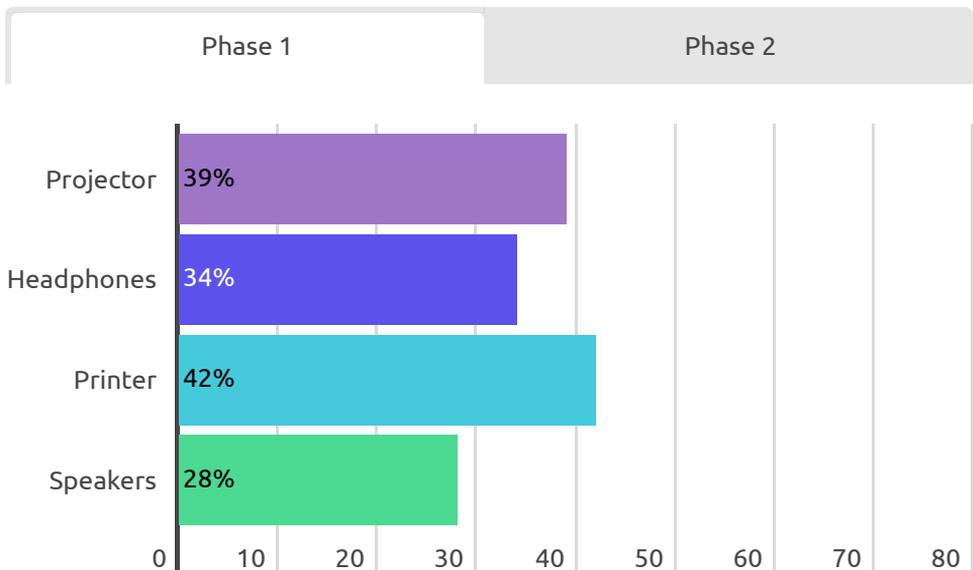
Chart 8: Student IT Confidence

| Self Rating P1 | Self Rating P2 | Peer Rating P1 | Peer Rating P2 |

Bar chart - Self Rating P1:
- Very Weak: 16%
- Weak: 14%
- Average: 56%
- Strong: 10%
- Very Strong: 4%

Students were asked to rate their ability with computers, and also rate their peers in Phase 1 and 2. Chart 8 shows that the majority of students (60%) classify themselves as having 'Average' computer skills, with 17% less (than in Phase 1) categorising themselves as having 'Weak' or Very Weak' skills. Students generally rate their peers as having similar computer skills or better, with 62% rating their peers as having 'Average' skills.

Chart 9 shows assistive technology access for students, with an average increase of 21% in Phase 2, across all types of equipment.

Chart 9: Student Assistive Tech Access

| Phase 1 | Phase 2 |

Bar chart - Phase 1:
- Projector: 39%
- Headphones: 34%
- Printer: 42%
- Speakers: 28%

Overall ICDL Results

The table below shows the results for all ICDL assessments, from a total cohort of 31 teachers and 459 students. Students were only assessed in the Computer & Online Essentials ICDL module.

Teacher ICDL Results

TYPE	MODULE	PASSES	FAILS	HIGHEST SCORE	AVERAGE PASS SCORE
Base	Computer Essentials	30	10	93%	85%
Base	Documents	29	19	100%	86%
Base	Online Essentials	31	3	100%	85%
Base	Spreadsheets	29	6	100%	86%
Intermediate	ICT In Education	27	7	100%	87%
Intermediate	Presentations	29	16	97%	83%
Advanced	Cybersecurity	4	1	88%	83%
Advanced	Financial Spreadsheets	1	6	83%	83%
Advanced	Management Spreadsheets	0	6	N/A	N/A
Advanced	Presentations (Advanced)	0	1	N/A	N/A
TOTAL or AVERAGE %		**180**	**75**	**95%**	**85%**

Student ICDL Results

GENDER	PASSES	FAILS	HIGHEST SCORE	AVERAGE PASS SCORE
Male	194	70	100%	85%
Female	235	56	97%	84%
TOTAL / AVERAGE	**429**	**126**	**99%**	**84.5%**

Key Figures

301 ICDL module certifications for **female** beneficiaries

805 ICDL assessments in total

94% of students are literate in Computer & Online Essentials

303 ICDL module certifications for **male** beneficiaries

Teachers passed an average of **6** ICDL modules

Total of **490** ICDL beneficiaries

Case Studies

Brian Ngugi - Highest performing male student

Brian passed the Computer & Online Essentials module with a score of 100%.

Christine Njuguna, Shalyne Wangui, Vallery Kendi - Top 3 performing female students

Christine, Shalyne, and Vallery were the joint top performing female students, each scoring 97% in the Computer & Online Essentials module. Vallery is in Secondary Form 4 at Naivasha Day Secondary School.

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.

4 QUALITY EDUCATION

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.

5 GENDER EQUALITY

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

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

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.

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Sustainability

The Kenya Digital Schools project has directly benefitted 31 school staff and over 8,980 students across the 10 schools over the last 3 years. It is useful to consider the longer-term impact of the project and therefore its sustainability.:
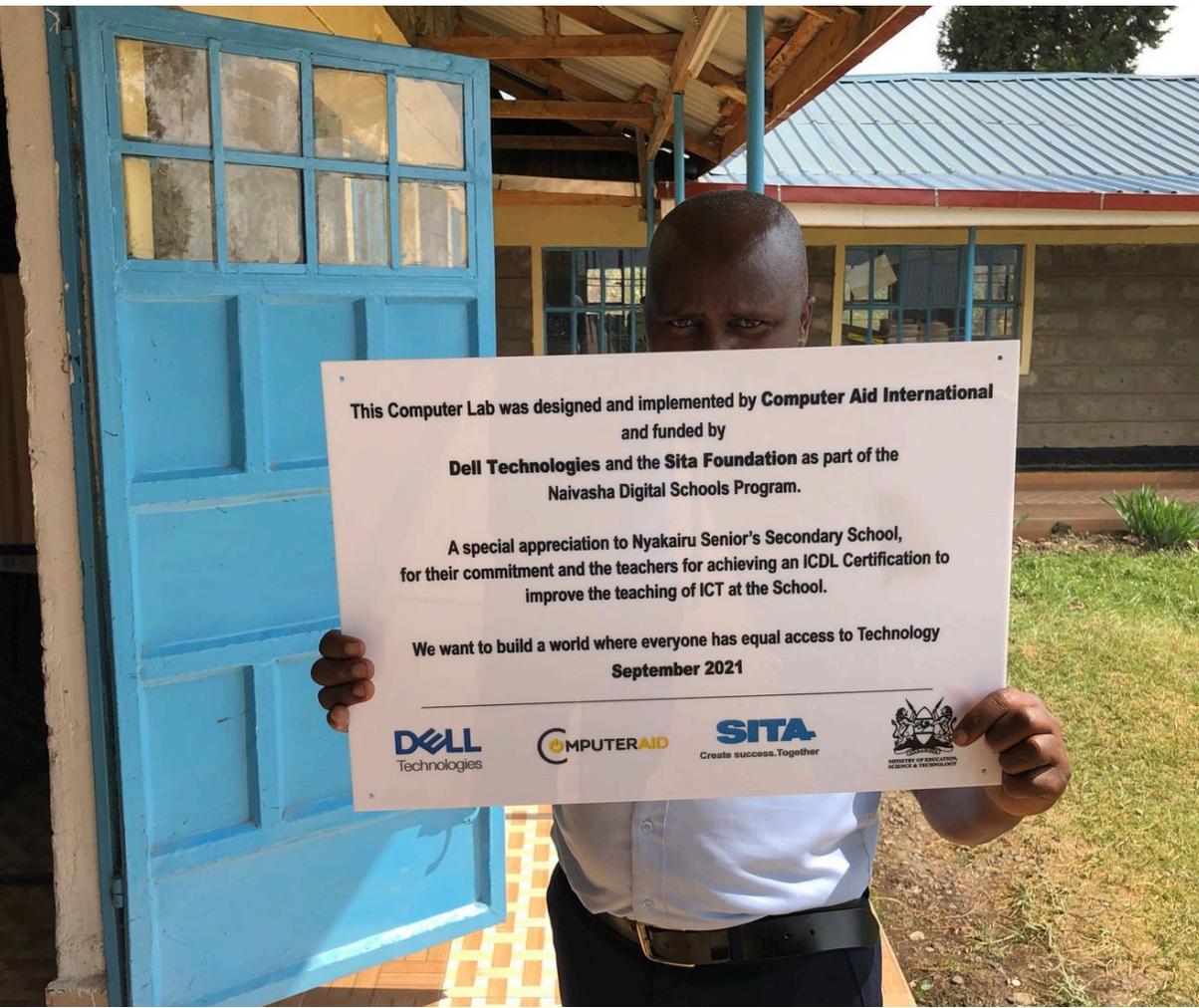
- Continued access and usage of computer labs in classes with 20 PCs and assistive technology such as printers and projectors, at each school. The labs are mostly utilised by 20-30 students per class, for 30-60 minutes per session. We estimate that a further 15,715 new students will access the computer labs at the 10 schools over the next 7 years, bringing the total student beneficiaries to over 24,600.
- Further opportunities for school staff to take ICDL assessment as needed. The schools and teachers are well acquainted with ICDL trainer Martin Kuria through their training, and we hope they will stay connected with each other.
- Project has already expanded to a further 12 schools in Naivasha due to crowd-funding from other corporates.
- There is scope for further schools to benefit from the project in the future as part of a further expansion.

Summary

In summary, the Kenya Digital Schools project has successfully progressed and ensured that a large portion of Secondary students across the 10 schools have basic ICT skills; 94% of students from Form 1 - Form 3 passed the ICDL module in Computer & Online Essentials. This indicates that the outcomes created by the project of improving ICT access, usage, and skills have been successful. The 429 students who passed the ICDL module now have certification which provides them with a competitive advantage in higher education and their careers, relative to their peers in Naivasha.

Although the project is formally ending, the benefits of the project will continue across the schools, through continued access and usage of computers and assistive technology in classes. This will continue to benefit students accessing the computer labs and improve their ICT skills.