Rwanda Digital Schools

Phase 3 Final Report
December 2023

Introduction

The Rwanda Digital Schools project has been working to improve teacher, student and educational outcomes at 8 Secondary schools across Kigali. In Phase 1, computer laboratories were setup across each of the schools and 3 teachers per school were trained and assessed in ICDL modules. In Phase 2, further teacher training was offered and students gained more exposure to the computer labs, working to strengthen their ICT skills.

In its final phase, the project has achieved its goal of ensuring that students leave Secondary school with core ICT skills, having tested 830 students (all students from Senior 3 (S3) across the 8 schools) in the ICDL module 'Computer & Online Essentials.' The testing provides insight into students' digital skills across the schools and also offers them the opportunity to gain internationally recognised certification which will improve their educational and career prospects.

Project Summary

Year 1 - 2020-21

School selection took during 2020 with the Rwandan Education Board (REB), shortlisting schools based on their needs and ability to successfully host the equipment. This happened before funding was received and before the project formally launched in 2021. Equipment was delivered to the 8 schools, and computer lab installations began in October 2021. Teacher ICDL training started online in May 2021, due to the pandemic.

Year 2 - 2022

In Year 2, the focus was on providing further teacher training, especially to new teachers who had not completed any prior modules. In total, 23 new teachers were trained in Year 2 and had the chance to be certified in up to 8 modules. This included 2 newer modules, Online Collaboration, and Cybersecurity. This led to a further 93 ICDL modules passed with an average pass score of 82%.

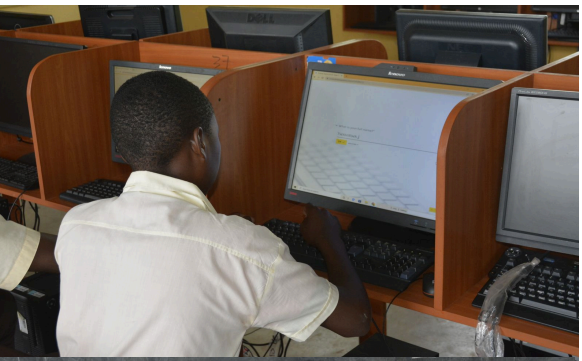
Year 3 - 2023

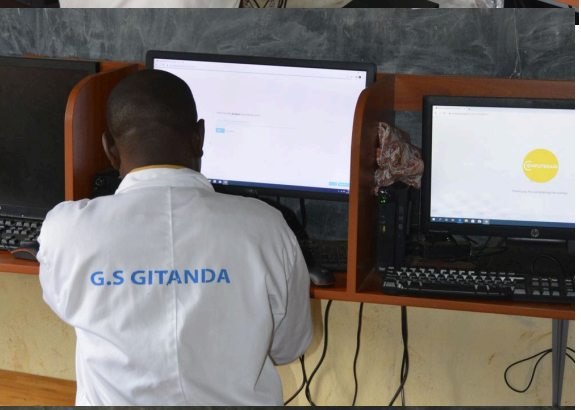
In Year 3, all students from Senior Grade 3 (students are around 15 years old) across the 8 schools were assessed and certified in a core ICDL module covering computer and online essentials. S3 students were selected since they are 3 years from graduation, and all students at that level have had 3 years of exposure in the computer lab as all schools provide ICT training from S1-S3.

In order to prepare the schools for this task, a short training session occurred in March 2023 for 2 teachers from each of the schools. This allowed them to familiarise themselves with the ICDL testing platform. The student testing took place between July-October 2023 and a total of 830 students were tested with 843 assessments taking place. In total, 786 students passed the module and therefore 95% of the S3 cohort passed.

School Summary

Although all the schools are Secondary schools, not all schools teach senior secondary grades (S4-S6). In these instances, students are required to move to another school which is not always feasible given the remote locations. All schools teach secondary grades S1-S3 as standard and ICT is taught to all students in S1-S3. The computer labs are mainly used for ICT, although some schools also use the lab for other subjects. All labs are functioning, and all computers were working well during our visit in October 2023. The REB supports the schools in various ways: this can include providing internet access, supplying an ICT teacher, or assisting with power facilities. Three of the schools had an ICT teacher provided thanks to the project.





Nyiragiseke

The poorest of all the schools, they have had a high turnover of staff, with 3 different headteachers during the life of the project and all ICT trained teachers also leaving. They also have suffered with power outages, recently for 7 months, and are located in one of the poorest regions of Kigali. 14 of the 23 students who took the ICDL module passed.

Gitanda

Also a poor school, but has performed quite well in the student assessments with 17 of their 18 students passing the ICDL module and being certified. At Gitanda, there has been less staff turnover and better management of the school. They also have a good internet connection and also use the computer lab at Primary level.

Busanza

Busanza is one of the wealthiest schools situated in an affluent part of Kigali. 187 of their students took the ICDL assessment, with 184 passing and being certified in the ICDL module. They have 2 computer labs, one provided by Computer Aid and another provided by a different organisation. None of their ICDL trained teachers have left the school.

St. Vincent Pallotti

Another of the wealthiest project schools; similarly to Busanza, has a second computer lab provided by a different organisation, but labs are mainly used for ICT due to a packed timetable. A total of 224 students took ICDL assessment with 209 students passing.

Cyimbazi

Cyimbazi had a total of 81 students take ICDL assessment and 78 of them passed. The school also has a very good internet connection. They offer TVET (Technical and Vocational Education and Training) to older students and generally use the computer lab very often for a wide range of subjects in addition to ICT. Their ICT teacher has been at the school before the project started.

Musave

Situated in a poorer area of Kigali, the computer lab at Musave was split into 2 separate labs with 20 computers each, drastically improving student results. They also have 2 ICT teachers provided by REB at the previous teacher was struggling. A total of 39 students took the ICDL module at Musave, with 34 passing.

Nyabagendwa

Another strong school and although in a poor area, has very committed staff and no ICDL trained staff left the school. A total of 119 students took ICDL assessment at Nyabagendwa and 113 passed. Each class also has access to the computer lab weekly and it's also used at Primary level.

Rutabo

One of the strongest schools with no staff turnover, Rutabo had 139 students take ICDL assessment with 137 passing. The school computer lab is also used at Primary level. The school is well-managed and has a dedicated ICT teacher.

Teacher Outcomes

The key data from teacher surveys across the 3 phases is presented below. Chart 1 shows that most teachers have been teaching grades S1-S3 across the 3 project phases. Chart 2 indicates that 60% of teachers have class sizes in the computer labs with more than 31 students. It is promising that many students are accessing the computer labs in each class given their large capacity of 40 computers.

Chart 1: Teacher Grades

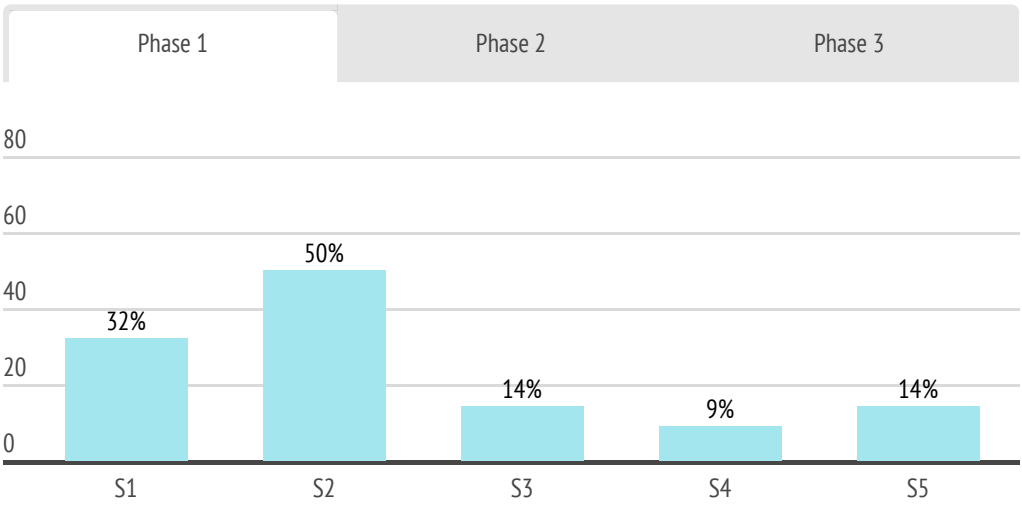
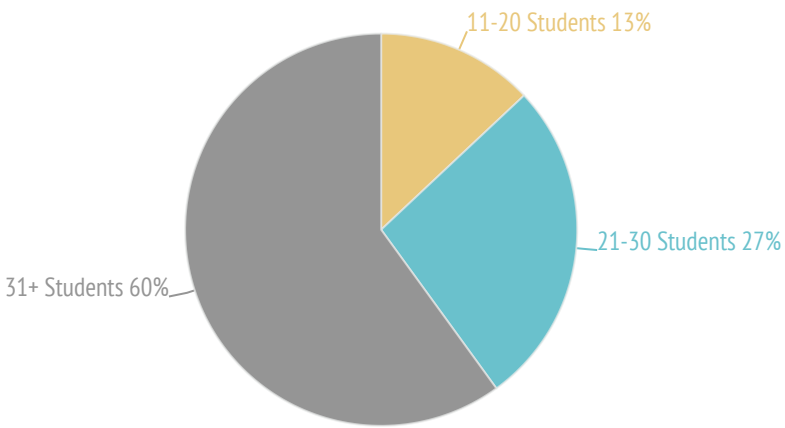


Chart 2: Teacher ICT Class Sizes



Nizeyumana Bonaventure, Senior Grade 1 ICT Teacher *at St . Vincent Pallotti*

"As an ICT (Information and Communication Technology) teacher, my lesson content preparation involves a structured approach. I begin by analysing the curriculum and defining clear learning objectives. Next, I select appropriate resources and materials, with a strong emphasis on integrating technology to enhance engagement and interactivity. Content creation is a crucial step, which includes designing presentations, worksheets, and multimedia materials. I also plan assessments to gauge student understanding and skill development, all while keeping differentiation in mind for diverse learners. During lessons, I use ICT tools and strategies, collecting feedback for continuous improvement. Staying updated through professional development ensures that my lessons are dynamic, aligned with standards, and responsive to evolving educational needs and technological advancements.

I have been utilizing the computer lab as an integral part of my classes to enhance learning and foster digital literacy among students. The computer lab serves as a versatile space where I can integrate technology seamlessly into my lessons. I employ it for research activities, allowing students to access a wealth of information, conduct online experiments, and collaborate on projects.

It also serves as a platform for skill-building, where students learn to use software applications, coding, and digital design tools. Moreover, I leverage the lab for interactive and multimedia presentations, engaging students in dynamic, visual learning experiences. The computer lab has become a hub for fostering critical thinking, problem-solving, and real-world digital skills that will benefit students academically and in their future careers."

Chart 3: Teacher ICT Skill Confidence

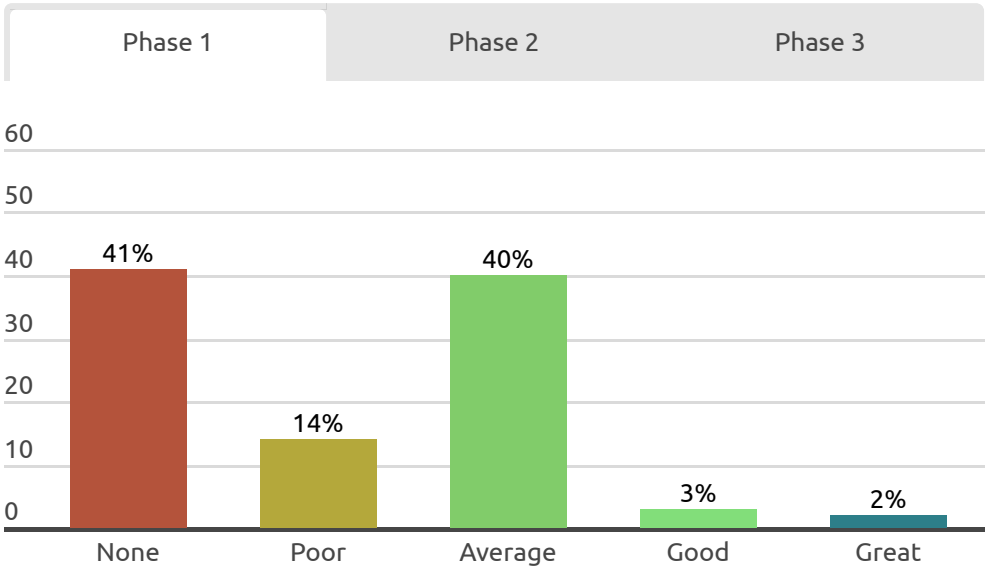


Chart 3 above shows teacher confidence levels in ICT at Phase 1, 2, and 3. The change in confidence is clearly observable as the project progresses. The majority of teachers now categorise themselves as having 'Great' (53%) or 'Good' (27%) computer skills. Chart 4 below shows the average duration of classes in the computer lab. Most teachers (73%) are using the computer lab for 30-60 minutes per class.

Chart 4: Average ICT Class Duration

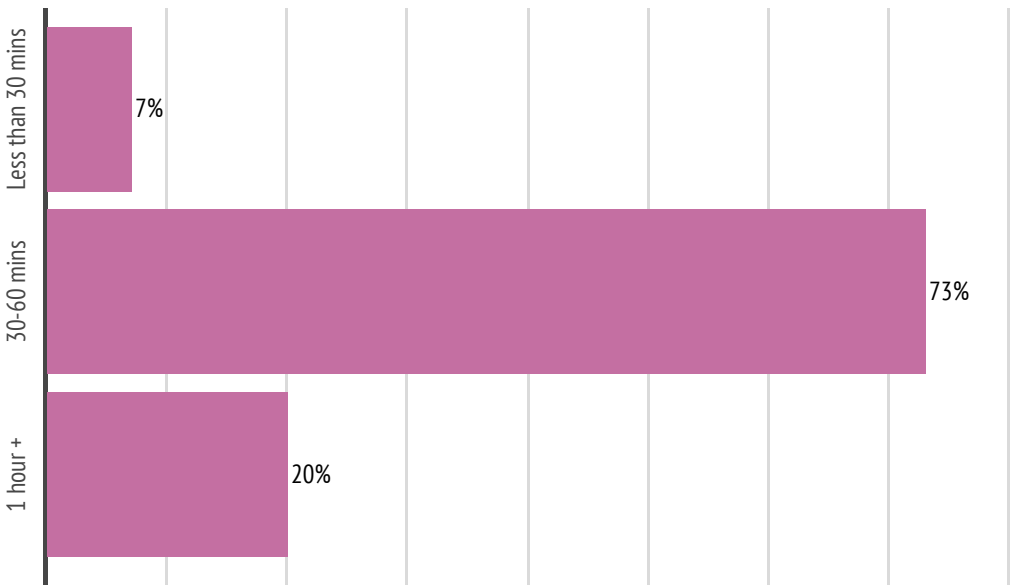


Chart 5: Student Class Indicators

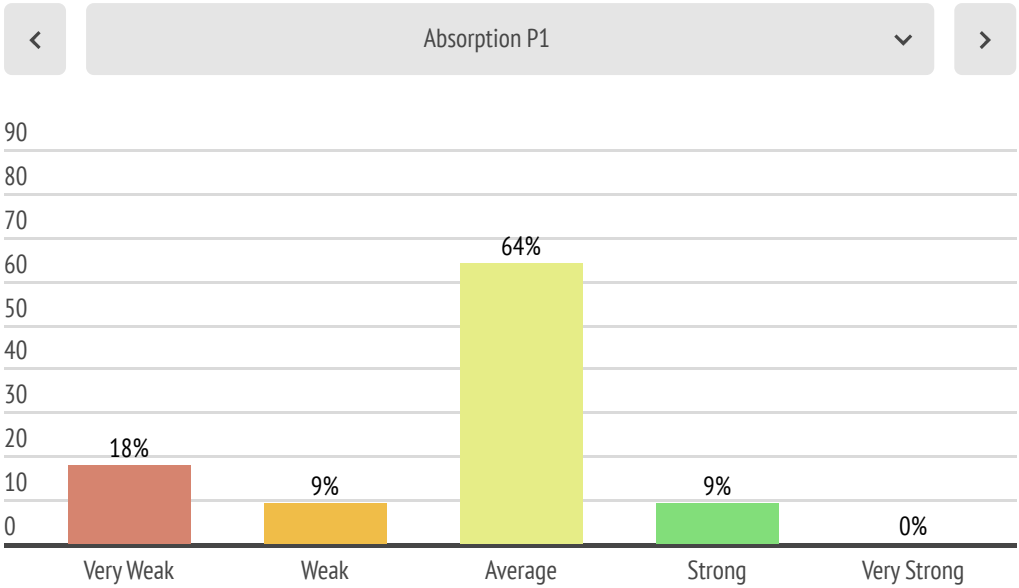
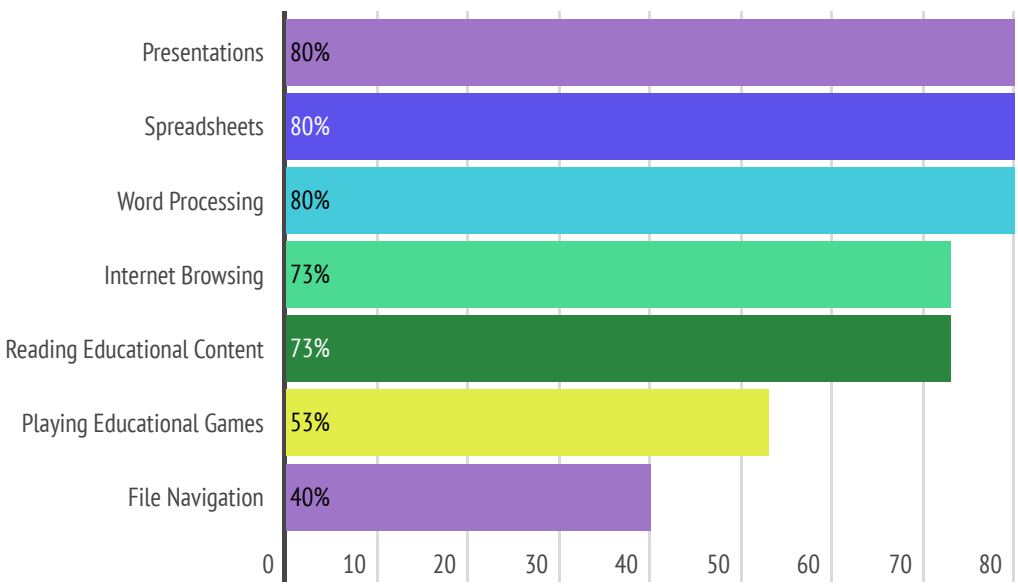


Chart 4 above indicates teacher ratings for various student indicators across Phase 1, 2, and 3. Student absorption in classes across schools was mostly rated (73%) as 'Average.' Levels of student interaction in classes were better with 47% of of teachers choosing 'Strong' in Phase 3. Finally, achievement levels in classes were mostly rated (60%) as 'Strong.' There has been a good improvement in these indicators, especially in Interaction and Achievement since Phase 1.

Chart 5 below shows which types of activities teachers have been completing with students in class. The Microsoft Office suite has been particularly popular as shown in the chart.

Chart 6: ICT Class Activities



Student Outcomes

A summary of the key data from the student surveys in Phase 1, 2 and 3 is presented below. Students across the 8 schools completed the final endline surveys in November 2023 with a total of 163 students submitting responses. Among respondents, 55% were Male and 45% were Female. Most students responding were in Senior grade 3 (72%) and Senior grade 2 (20%).

Chart 7 shows how often students have accessed their computer labs during class across all 3 phases. Most students are now accessing their computer lab more regularly with 71% of students accessing 'Weekly' in class and 25% accessing 'Daily.' Outside of class access has also risen, with 60% of students accessing the computer lab 'Weekly.'

This chart illustrates a clear improvement in student access to computers and is part of the reason why student usage has increased and therefore ICT skills have improved.

Chart 7: Student Lab Class Access

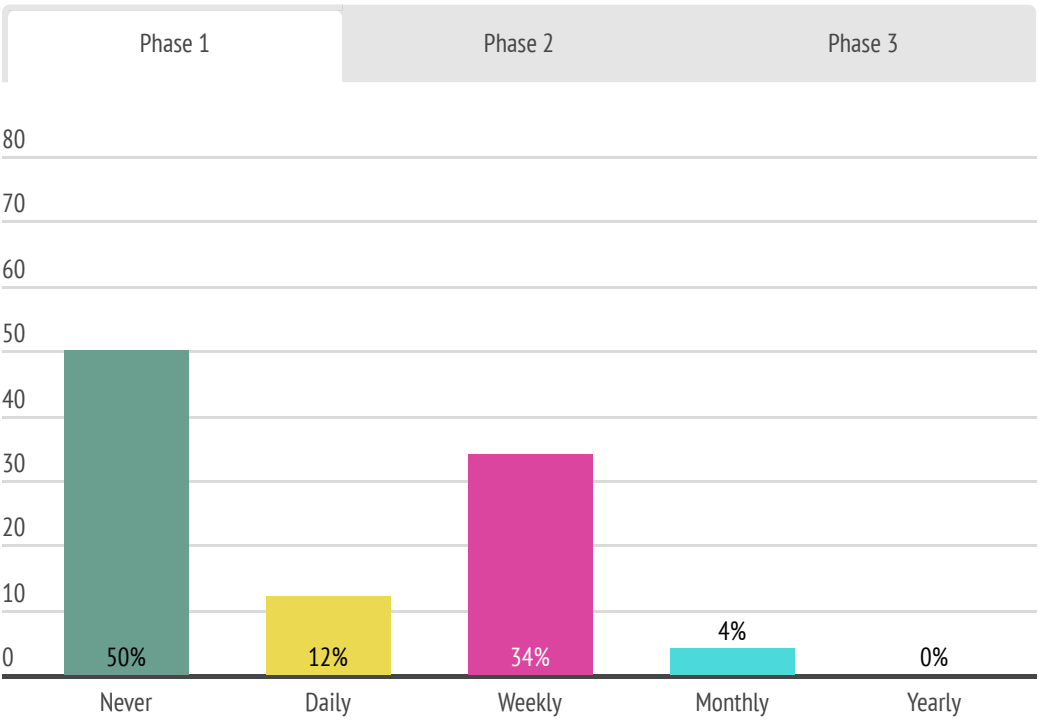


Chart 8: Duration Of Student Lab Access

In Class P1 | In Class P2 | In Class P3

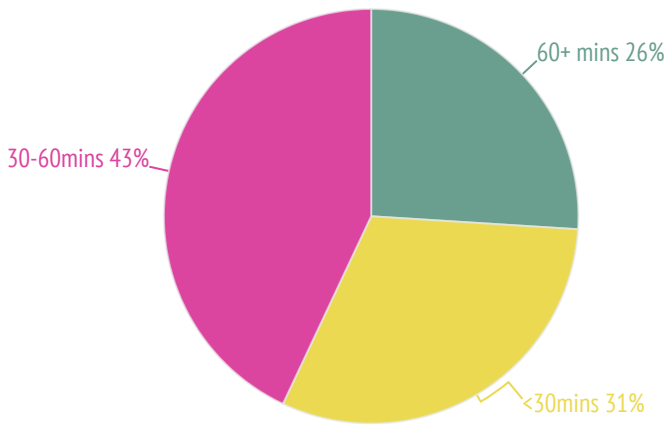


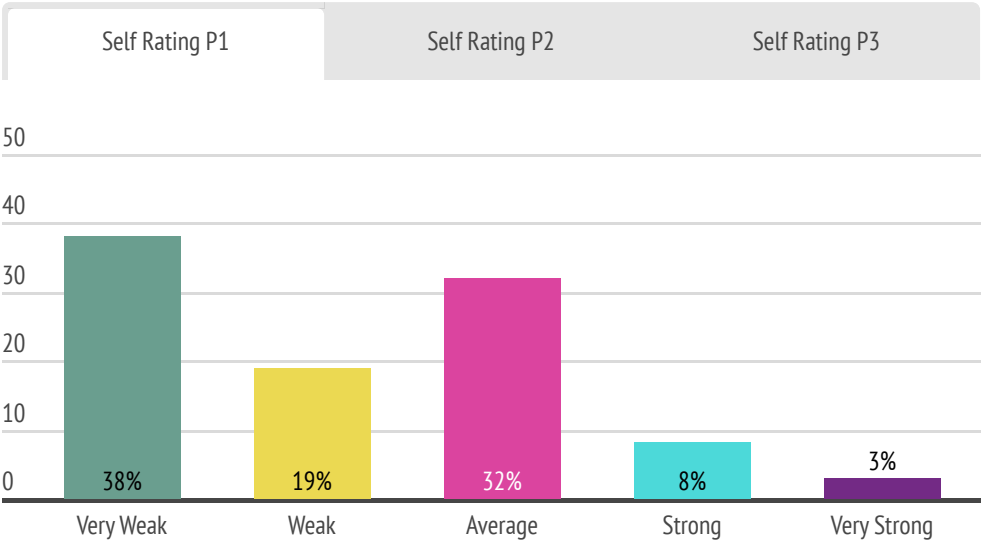
Chart 8 shows the duration of access for students inside of class across all 3 phases. Most students (61%) are now accessing the lab for 30-60 minutes, so an increase of 18% from Phase 1. Outside of class, most usage (49%) is also for 30-60 mins.

Relating to activities in the computer lab, 83% of students are using word processing software in classes (an 8% increase from Phase 2), and internet browsing is also a popular activity in classes with 80% of respondents stating this (a 10% increase from Phase 2). Across the schools, 51% of students are able to use a machine on their own, whilst 27% share with another classmate. This is an improvement on Phase 1, where only 38% of students were accessing a computer on their own.

Iradukunda Teta Queen , Senior 3 Student *at St. Vincent Pallotti*

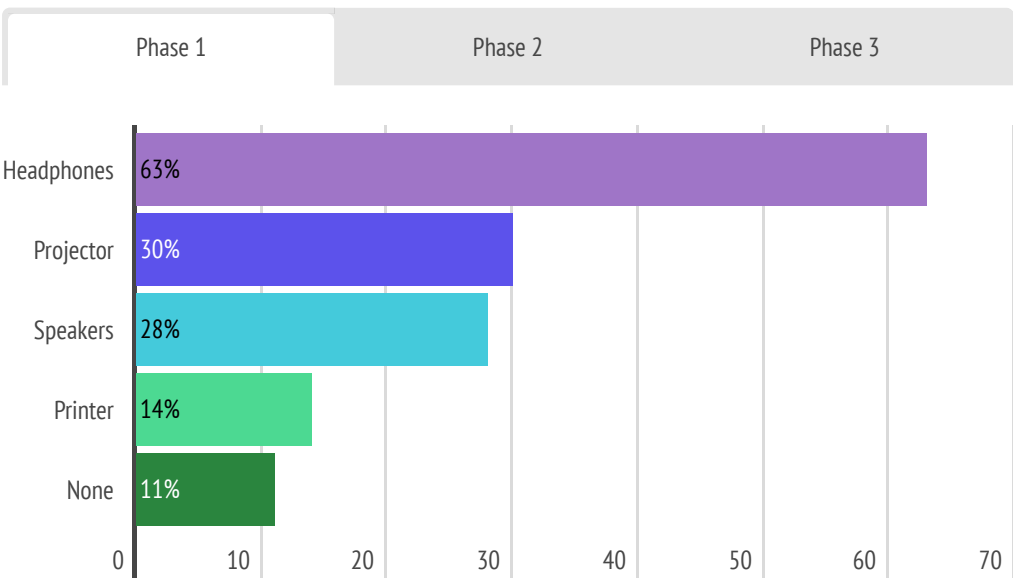
"Through the use of digital platforms and online resources, I can access a wide range of educational materials, collaborate with peers on projects, and conduct research more efficiently. It has not only improved the way I learn but has also equipped me with vital digital skills that are essential in today's technology-driven world, preparing me for future academic and professional endeavours."

Chart 9: Student IT Confidence



Across all phases, students were asked to rate their ability with computers. Chart 9 shows that the majority of students (50%) now classify themselves as having 'Average' computer skills, with 39% stating their skills are 'Strong' or 'Very Strong.' Self Rating has significantly improved as the project has progressed, with a 46% increase in students rating themselves between Average and Very Strong. Chart 10 shows assistive technology access; we can observe that across phases, the access of all equipment has steadily increased, with an average of 62% of assistive technologies being accessed by students in Phase 3.

Chart 10: Student Assistive Technology Access



Overall ICDL Results

The tables below shows the total results for all ICDL assessments, from a total cohort of 47 teachers and 830 students. Students were tested in the 'Computer & Online Essentials' module. The student cohorts for S3 students vary at each school, and this is why some schools have fewer students who were assessed.

Teacher ICDL Results

MODULE TYPE	MODULE	PASSES	FAILS	HIGHEST SCORE	AVERAGE PASS SCORE
Base	Computer Essentials	33	26	94%	82%
Base	Documents	33	24	97%	85%
Base	Online Essentials	37	17	91%	81%
Base	Spreadsheets	28	6	97%	85%
Intermediate	ICT In Education	26	21	94%	81%
Intermediate	Presentations	27	11	94%	83%
Intermediate	Online Collaboration	16	2	90%	82%
Intermediate	Cybersecurity	4	0	86%	79%
TOTAL / AVERAGE		**204**	**107**	**93%**	**82%**

Student ICDL Results

SCHOOL	PASSES	FAILS	HIGHEST SCORE	AVERAGE PASS SCORE
Busanza	188	3	100%	82%
Cyimbazi	79	3	94%	81%
Gitanda	17	2	91%	80%
Musave	34	5	97%	84%
Nyabagendwa	114	6	91%	82%
Nyiragiseke	14	9	97%	88%
Rutabo	138	4	91%	81%
St. Vincent Pallotti	209	18	91%	81%
TOTAL / AVERAGE	**793**	**50**	**94%**	**82%**

Key Figures

578 ICDL certifications for **female** beneficiaries

1,154 ICDL assessments in total

95% of students are literate in Computer & Online Essentials

419 ICDL certifications for **male** beneficiaries

Teachers passed an average of **4** ICDL modules

Total of **877** ICDL beneficiaries

Case Studies

Patrick Marara, Senior Grade 3 student at Busanza

Patrick had the highest ICDL score across all students, passing the Computer & Online Essentials module with a score of 100%.

Kanyana Justine, Senior grade 3 student at Musave

Kanyana was the highest performing female student across all schools, passing the Computer & Online Essentials module with a score of 97%.

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

Responsible Consumption And Production

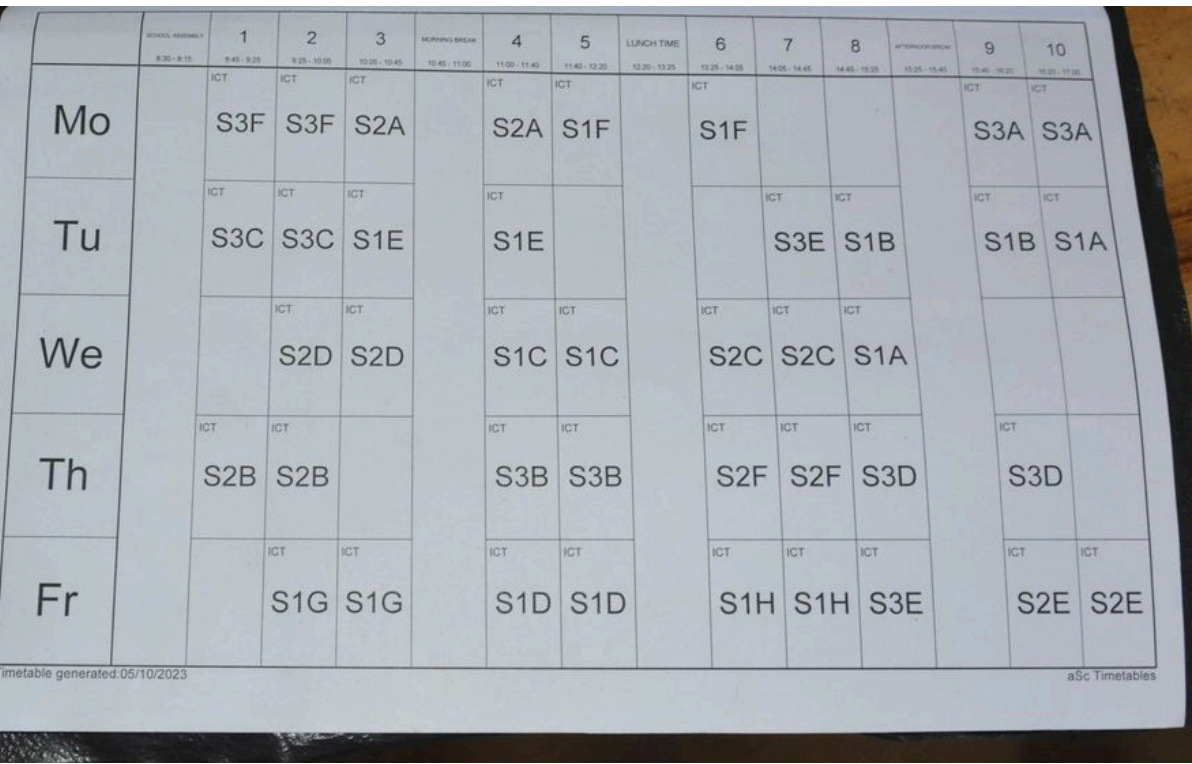
This project contributes to Target 12.5 of SDG 12 which states:
By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.

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.

Sustainability

While the project has directly benefitted 47 school staff and over 13,000 students over the last 3 years, it is important to consider the longer-term impact of the project and therefore its sustainability. Even as the project concludes, there will be:

- Continued access and usage of computer labs in classes with 40 PCs and assistive technology such as printers and projectors, at each school. Equipment was working well when Computer Aid recently visited Kigali in October 2023. The timetable below is an example of how often the lab is utilised for ICT classes at St. Vincent Pallotti, with 40 classes taking place per week with S1-S3 students. The lab is utilised for around 27 hours per week. We estimate that a further 30,000 new students will access the computer labs at the 8 schools over the next 7 years, bringing the total student beneficiaries to over 40,000.
- Opportunities for school staff to take further ICDL assessment as needed. The schools and teachers are well acquainted with ICDL staff through their training, and we hope they will stay connected with each other.
- Continued school support from the REB as needed, with help supplying ICT staff, power facilities, and internet facilities.



	1	2	3	4	5	6	7	8	9	10
Mo	ICT S3F	ICT S3F	ICT S2A	ICT S2A	ICT S1F	ICT S1F			ICT S3A	ICT S3A
Tu	ICT S3C	ICT S3C	ICT S1E	ICT S1E			ICT S3E	ICT S1B	ICT S1B	ICT S1A
We		ICT S2D	ICT S2D	ICT S1C	ICT S1C	ICT S2C	ICT S2C	ICT S1A		
Th	ICT S2B	ICT S2B		ICT S3B	ICT S3B	ICT S2F	ICT S2F	ICT S3D	ICT S3D	
Fr		ICT S1G	ICT S1G	ICT S1D	ICT S1D	ICT S1H	ICT S1H	ICT S3E	ICT S2E	ICT S2E

Timetable generated:05/10/2023 aSc Timetables

Summary

In summary, the Rwanda Digital Schools project has successfully progressed and ensured that the majority of S3 students across the 8 schools have basic ICT skills; 95% of students from S3 passed the ICDL module in Computer & Online Essentials, and this is testament to the outcomes created by the project of improving ICT access, usage, and skills. The 786 students who passed the module now have ICDL certification which provides them with a competitive advantage in higher education and their careers, relative to their peers in Kigali.

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.