SCRATC²H 2050

Supporting Coding among Rwandan Adolescents & Teachers through the Curriculum & Clubs Heading for Rwanda 2050

July 2020 - June 2022

PROJECT SUMMARY

★ VVOB office

All 54 Schools

1 out of 3 teachers were **female**

VVOB - Education for development - together with the Rwanda Basic Education Board and the Rwanda Coding Academy (under Rwanda TVET Board) implemented the Scratc²h 2050 Project, funded by the Belgian Government, through Enabel's Wehubit programme. The Scratc²h 2050 Project aimed to improve the relevance of secondary STEM education and to strengthen the link with the world of work, by supporting STEM and ICT teachers in Kayonza district to set up after-school coding clubs in their schools. This is a two-year pilot project is implemented from the 1st of July 2020 to the 30th of June 2022.

In the framework of the project, 164 STEM and ICT teachers from 54 secondary schools in Kayonza district were trained on Scratch through a blended learning trajectory. During the learning trajectory, teachers started to facilitate coding clubs with their learners to provide them with the opportunity to truly develop digital skills in an enjoyable environment, combining fun with learning the language of generation Z: the programming language.

The Scratc²h 2050 Journey

Digital Literacy Training and development of the pedagogical guide

Coding Club Cycle 1

Hackathon Competition 1

Exposure visit 2

Blended Training Trajectory for 164 teachers

Exposure visit 1

Coding Club Cycle 2

Hackathon competition 2

Scratched community platform

★ Meet Up sessions

HACKATHON COMPETITIONS

At the end of each coding club cycle, learners competed in a Scratch competition through a hackathon. The competition started at the school level, continued at the sector level and finished at the district level, through a Scratch Day celebration. During this Scratch Day, each winner at the sector level had the opportunity to present their Scratch project, followed by a Q&A. The top 3 Scratch projects of each competition have been awarded.

"The experience in the hackathon I had today was great. I learned that I can do anything with coding. You can even reach your dreams."

Ornella Irahari, learner from Fawe Girls School, during the hackathon competition.

LINKING CODING WITH THE WORLD OF WORK: EXPOSURE VISITS

To demonstrate the potential of coding skills in the world of work, and to trigger students' curiosity for a career in ICT, exposure visits to leading tech companies were organised for selected students and their teachers. These exposure visits offered an opportunity for learners and teachers to understand why coding skills are important in professional life and how such skills can be used.
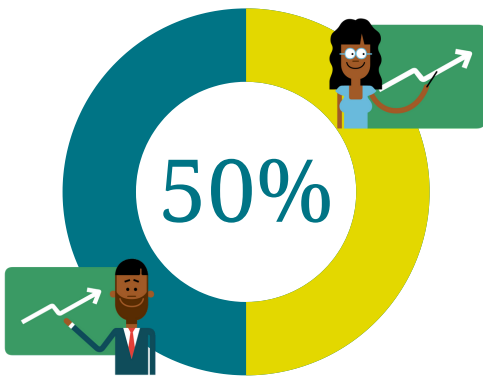
"This exposure visit made me start dreaming about becoming an expert in coding and eventually create a game development company."
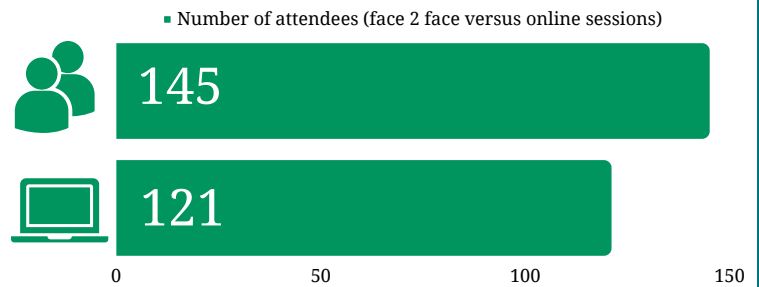
Jeremiah Nkurunziza, learner from New Life Christian Academy, during an exposure visit in Kigali.
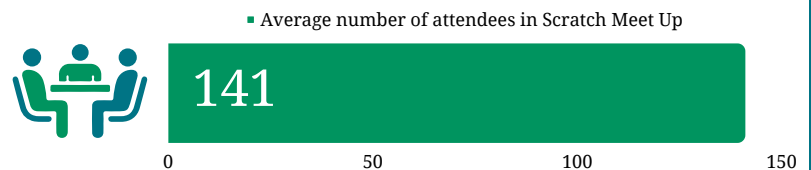
PROJECT OUTPUTS

274 coding clubs, reaching 3724 learners of which 50% girls

50%

Blended trajectory attendance

■ Number of attendees (face 2 face versus online sessions)

145	
121	

0   50   100   150

Meet Up attendance

■ Average number of attendees in Scratch Meet Up

141

0   50   100   150

Open Educational Resources

Pedagogical Guide

10 STEM subject lesson plans
5 coding session plans

27 instructional videos
2 Unplugged coding videos

Get started with our resource library of materials developed during the *Scratc²h* 2050 project

PROJECT END-LINE EVALUATION RESULTS

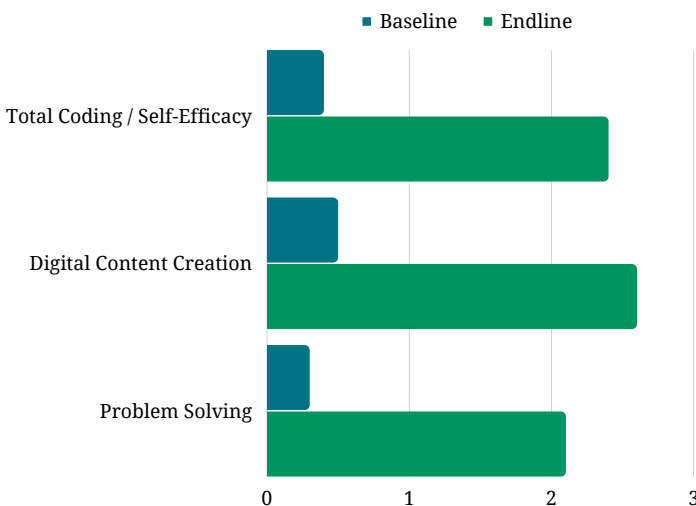## 1) Closing the digital divide with **teachers**

Digital Litteracy

On average, teachers increased their digital literacy scores by 12 points from baseline to endline. While female teachers demonstrated lower levels of digital literacy overall, they also had a greater relative increase in score from baseline to endline. By the end of the intervention, the gap between Male and Female teachers lessened from a nine-point difference to less than a four-point difference.

Content Creation in Scratch

Teachers saw significant improvement in Scratch knowledge when compared to baseline scores. Most teachers (78%) were completely or moderately confident in at least one skill related to digital content creation.
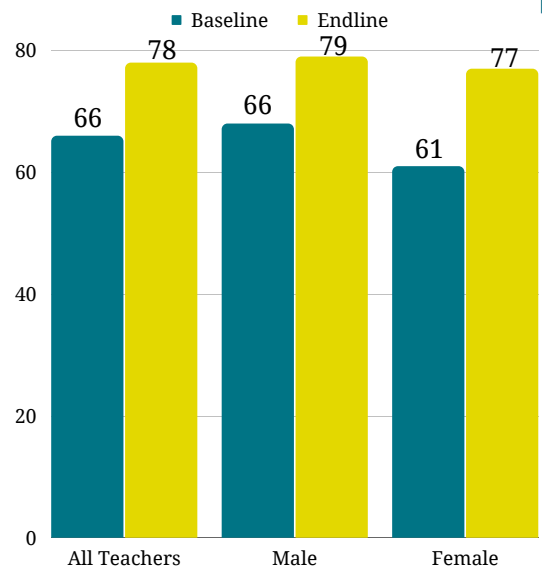
Comparison in Teachers' Average Digital Literacy Scores

■ Baseline ■ Endline

	All Teachers	Male	Female
Baseline	66	66	61
Endline	78	79	77

"The training put me on a good standard regarding the use of Scratch and other technology skills that helped me to teach to the students, and I am confident about what I am teaching."

- Teacher, Male

Average score at baseline and endline by category

■ Baseline ■ Endline

Total Coding / Self-Efficacy

Digital Content Creation

Problem Solving

0   1   2   3

Confidence when leading Scratc²h clubs

■ Baseline (%) ■ Endline (%)

Self Confidence

Leading Coding Clubs

In total, 74% of teachers feel confident in their ability to lead a Scratc²h coding club.

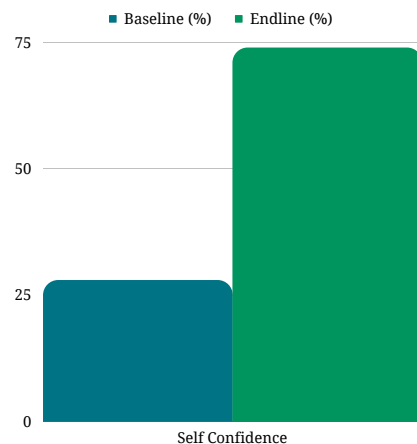# PROJECT END-LINE EVALUATION RESULTS

**Digital Technology and Scratch in the Classroom**

Teachers' practices around Scratch/coding in the classroom shifted considerably from the baseline to endline responses. In their endline surveys, most teachers (over 80%) agreed or strongly agreed that they transferred concrete skills to students through their practices such as by teaching them how to give credit to the digital work of others and behave safely online. Additionally, most teachers (70% or more) reported leveraging digital technologies to foster student creativity, collaboration, or to engage their students.

Percentage trained teachers who reported competency when integrating Scratch into STEM/ICT lesson plans

ALL **66%**

63%

67%

2) Closing the digital divide with **learners**

Percentage of learners meeting high level of proficiency on the digital literacy assessment

86 %
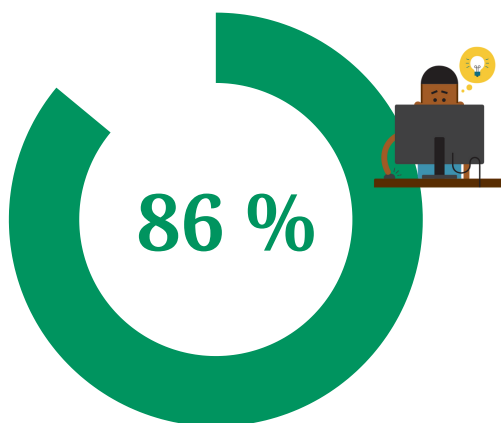
> *"Participating in a Scratch club increased my curiosity to know more not only in the technology world but also in my academics, and that spirit of curiosity together with working often with teachers in the scratch club opened me to asking questions when I am in class to understand more about introduced chapters in class which led to positive results where my academic performance increased remarkably."*

Learner, Female

3) Sustainability

Evidence suggests that teacher and learner motivation, school leader support, and general district support will drive the sustainability of Scratch coding clubs and other outcomes from the Scratc²h 2050 project. Additional support, such as offering more teacher training with a continuous professional development model, and engagement with other Scratch initiatives, like the hackathon and exposure events, would also be helpful for sustaining project outcomes and impacts.

CHANGE STORIES

ANGEL INGABIRE (LEARNER)

New Life Christian Academy

Scratch has made me feel more interested in coding as I have found it very fun and easy. In addition, it enabled me to gain new skills in using Scratch as an easy way to code without many processes. Moreover, through Scratch, I was able to attend an exposure visit which made me see all the things you can do with it. I learned how you can use coding through Scratch, and make a robot function. I was not used to attend many clubs at school before, but when I joined the Scratch club, I started to be engaged in it a lot. It even motivated me to keep on loving my major (IT) for now. The way that I view opportunities for my future has also changed, as I have decided to never take any opportunity for granted or judge it, regardless of how simple it may look. This is because, you never know what it may bring afterward, and where the chances come from.

ALICE NIYOMUKIZA (LEARNER)

GS Rwisirabo

Today, I am more open- minded compared to before as now I am even willing to innovate, think out of the box, explore and learn. And also, my knowledge and skills increased, mainly computer skills thanks to Scratch coding club, I spend more time using a computer. Participating in Scratch club increased my curiosity to know more not only in the technology world but also in my academics, which led to positive results where my academic performance increased remarkably. Thanks to Scratch clubs, I have access to computer where in free time I can do additional research on what I learnt in class or work on a project related to one of my courses hence practice Scratch by also revising my course. My opportunities in the future expanded from limited choices to a variety of choices. For example, participating in Scratch clubs opened me to the idea of pursuing computer science at university when that was not among my options before, as I thought Computer Science was hard and complicated. Now I believe I will have different opportunities in the future.

NZABARANKIZE J. DAMASCENE (TEACHER)

GS Juru

Scratch was something new to me and I see it as an advantage because now, there are schools which can employ me because of my skills in Scratch. I see that the skills I got will help me a lot in my career and also, I can use it to impact the society as we know the government is encouraging to use ICT in teaching and learning. I think these skills have made me more competitive as I have increased my computer skills and even my teaching methods.