SCIENCE INNOVATION AFRICA
(SCINOV AFRICA)

REPORT ON THE FREE TRAINING OF JUNIOR SECONDARY SCHOOL (JSS) TEACHERS ON CODING AND ICT INTEGRATION IN TEACHING AND LEARNING

Prepared by:
Science Innovation Africa (SCINOV Africa)

In Partnership With:
Teachers Service Commission (TSC) – Nyeri County Office

Training Curriculum Approve by:
Kenya Institute of Curriculum Development (KICD)

Training Period:
Five Day Teacher Training Programme Conducted Across the Eight Sub-Counties of Nyeri County during the November – December 2025 and April 2026 Holidays

EXECUTIVE SUMMARY

Science Innovation Africa (SCINOV Africa), in partnership with the Teachers Service Commission (TSC) Nyeri County Office, successfully implemented a five-day intensive hands-on training programme for Junior Secondary School (JSS) teachers on Coding and ICT Integration. The training was conducted across six sub-counties in Nyeri County using a Kenya Institute of Curriculum Development (KICD) approved curriculum to ensure alignment with national education standards and the Competency Based Education (CBE) framework.

The training programme aimed to strengthen teachers' capacity to integrate digital technologies into classroom instruction while introducing learners to foundational coding skills. It equipped teachers with practical coding skills, classroom implementation strategies, and project development experience, preparing them to effectively teach Scratch programming within the Competency Based Education framework.

The training reached numerous schools and resulted in high teacher satisfaction and confidence. A total of **267 teachers** from **210 schools** were trained and certified, representing schools with a combined learner population of **60,858 students**. Follow up monitoring shows that 6**7 schools (32%)** have already begun implementing coding and ICT integrated learning, reaching **14,788 students**. Several schools were also reported to have initiated coding clubs.

Despite the positive outcomes, implementation challenges were identified including limited digital devices, outdated tablets, insufficient coding learning resources, and gaps in digital literacy among teachers, leading to recommendations for updated equipment, ongoing mentorship, and continued teacher capacity building.

This report highlights the **programme outcomes, impact indicators, implementation challenges**, and **policy recommendations** to support the scaling of digital learning and coding education in Kenyan schools.

Team from Nyeri Central and Tetu Together with Senator Wahome Wamatiga(Center) and Dr. Joshua Gikonyo - Director Scinov(right).

ACKNOWLEDGEMENT

Science Innovation Africa (SCINOV) appreciates the support of the Teachers Service Commission (TSC) for partnering with us in the implementation of the Scratch Programming training for Junior Secondary School teachers in Nyeri County and for ensuring alignment with the Competency-Based Education (CBE) framework.

We further acknowledge the support of Senator Wahome Wamatinga, the County education stakeholders, and the Heads of Institutions of D.E.B Karatina Comprehensive School, Duncan Ndegwa Secondary School, and Munaini Primary School for facilitating the successful delivery of the training sessions.

We appreciate the commitment of all participating teachers and the contribution of the SCINOV facilitation team in supporting the successful implementation of the programme.

Finally, we thank Royal Media Services and Good News Television (GTN) for highlighting the training through media coverage, helping to raise awareness of the importance of digital skills and Scratch programming in junior school education.

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INTRODUCTION

The rapid advancement of digital technologies has created an urgent need for learners to acquire digital literacy, computational thinking, and problem solving skills. In Kenya, the introduction of the Competency Based Education (CBE) framework emphasizes the importance of practical skills, creativity, and innovation among learners.

Science Innovation Africa (SCINOV Africa) initiated the **Coding and ICT Integration Training Programme for JSS Teachers** to support the **National Digital Education Agenda** by equipping teachers with practical digital competencies. The programme was designed to ensure effective implementation of Scratch programming as outlined in the Junior School Pre-Technical Studies curriculum under the Competency Based Education (CBE) framework.

Implemented was carried out in partnership with the Teachers Service Commission (TSC) Nyeri County Office and delivered using a KICD approved curriculum, ensuring consistency with national curriculum standards.

1. PROGRAMME OBJECTIVES

The training programme aimed to achieve the following objectives:

1. Equip JSS teachers with practical Scratch programming skills suitable for teaching foundational coding skills
2. Strengthen teachers' ability to integrate ICT into subject teaching.
3. Support the implementation of digital learning within the CBE framework.
4. Promote computational thinking, creativity, and innovation among learners.
5. Develop a network of digitally empowered teachers capable of mentoring others.
6. Promote learner engagement through hands-on coding activities

2. PROGRAMME IMPLEMENTATION

3.1 Training Structure

The training programme was structured as a five day intensive professional development course adopting a hands-on practical approach, covering the following key areas of content.

1. Introduction to Scratch programming in the CBE context
2. Use of Scratch blocks (Motion, Events, Control, Sensing, Variables)
3. Designing interactive programs and animations
4. Classroom implementation strategies and pedagogy
5. Debugging and problem solving in Scratch
6. ICT integration in classroom instruction
7. Digital lesson planning

Teachers were required to complete both **theoretical and practical components** before certification. They engaged in guided practice, peer collaboration, class assignments, and individual project development. Each participant developed a Scratch project and presented it on the final day

A teacher working on his project during the training

A teacher presenting a calculator project that he had created.

3.2 Training Overview

Three (3) training cohorts were conducted, each cohort running for five (5) days. The trainings were held as follows:

- **Cohort 1: 11th – 17th November 2025 at DEB Karatina Comprehensive covering Mathira East and west Sub-Counties.**
- **Cohort 2: 24th – 28th November 2025 at Duncan Ndegwa Secondary School covering Nyeri Central and Tetu Sub-Counties.**
- **Cohort 3: 1st – 5th December 2025 at Munaini Primary School covering Mukurwe-ini and Othaya Sub-Counties.**
- **Cohort 4: 6th – 10th April 2026 at Narumoru Township Primary School Covering Kieni East Sub- County**
- **Cohort 5: 13th – 17th April 2026 at Mweiga High School Covering Kieni West Sub-County**

Ongoing training session at Ngangarithi Secondary

Teachers in Mweiga High during a training session

Teachers follow a presentation by one of them during a practical training session

3. PARTICIPATION STATISTICS

The table below shows the number of teachers, schools, and students represented by sub-county, with some teachers traveling from as far as Murang'a and Laikipia counties to attend the training.

SUB-COUNTY	TEACHERS TRAINED & CERTIFIED	SCHOOLS REPRESENTED	STUDENTS REACHED
Othaya	23	14	1882
Mukruweni	7	6	599
Tetu	39	32	6274
Nyeri Central	25	24	6021
Mathira East	25	20	3530
Mathira West	11	7	611
Kieni East	68	41	18173
Kieni West	70	57	15382
Mathioya - Murang'a	1	1	50
Laikipia East - Laikipia	20	7	4336
Embakasi South	3	1	4000
TOTAL	**267**	**210**	**60858**

The programme recorded significant participation from schools across Nyeri County demonstrating the strong demand among teachers for **structured digital skills training**.

4. GRADUATION AND CERTIFICATION.

A graduation ceremony was held to celebrate teachers who successfully completed the Scratch Programming training. Certified teachers were recognized for their dedication and commitment to integrating coding into their classrooms. The event was attended by notable guests, including Mrs. Catherine Mwenda, TSC County Director Nyeri, Madam Zillah Mwaghogho, County Quality Assurance and Standard Officer Representative Nyeri County, and Senator Wahome Wamating'a,

Senator of Nyeri County, who commended the teachers for their efforts and encouraged continued innovation in teaching.

Photo: Notable attendees at the Scratch Programming graduation ceremony, including the TSC County Director (Nyeri), the Nyeri County Senator, and the County Quality Assurance and Standards Officer.

Nyeri County Senator Wahome Wamatinga receiving the report during the graduation ceremony.

Madam Zillah Mwaghogho, County Quality Assurance and Standards Officer, delivering her speech during the event.

Nyeri TSC County Director Madam Catherine Mwenda presenting a certificate to one of the trained teachers

Graduates posing with their Scratch Programming certificates alongside the TSC County Director – Nyeri.

5. PROGRAMME OUTCOMES

6.1 Strengthened Teacher Capacity

Teachers gained practical skills in:

- Basic concepts of scratch programming
- Digital learning content development
- ICT integration in classroom instruction
- Digital lesson planning

6.2 Early Adoption of Coding in Schools

Monitoring and follow up assessment indicate that:

- **67** schools **(32%)** have already introduced coding activities reaching to **14,78 students**
- Coding lessons are being incorporated into learning activities
- ICT tools are being used more frequently to enhance subject teaching
- Coding clubs have already been created in several schools

6.3 Development of Peer Support Networks

Teachers have established informal professional networks where they:

- Share digital teaching resources
- Exchange experiences on coding implementation
- Support each other in addressing ICT challenges in schools

6.4 Increased Student Engagement

Teachers reported that coding lessons have significantly improved:

- Learner curiosity and motivation
- Problem solving abilities
- Creativity and innovation among students

Students are increasingly viewing technology as a **tool for creation rather than passive consumption**.

6. IMPACT INDICATORS

The programme has demonstrated measurable impact across multiple levels.

7.1 Teacher Level Impact

- **267 teachers** trained and certified
- Improved teacher confidence in using digital tools

7.2 School Level Impact

- **210 schools** represented
- **67** (32%) of the trained schools actively implementing coding programmes
- Coding clubs formed in several schools

7.3 Student-Level Impact

- 60,858 **students** represented
- **14,788 students** already benefiting from coding instruction

These figures highlight the multiplier effect of teacher capacity building, where training a small number of teachers can impact thousands of learners.

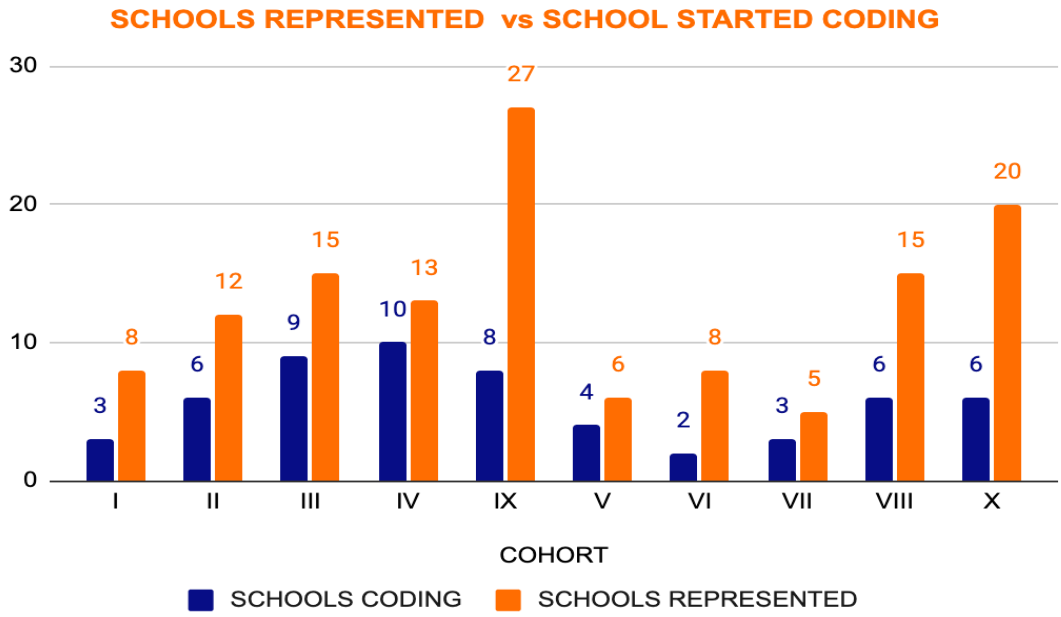
The programme monitored implementation of the skills and knowledge acquired by teachers during the Scratch Programming training, and to our surprise, students have already begun engaging with computational thinking, enhancing their critical thinking and creativity. Through this initiative, students are not just becoming users of technology but creators of it, nurturing the next generation of innovators in the tech space.

Students of Kianjogu Junior School during Scratch Programming Class.

Students of King'ong'o Junior School during a scratch programming lesson.

Mr. Lawrence Mathege teaching Scratch programming in a classroom with limited resources.

Grade 9 students at Ngaini Junior School Mathira



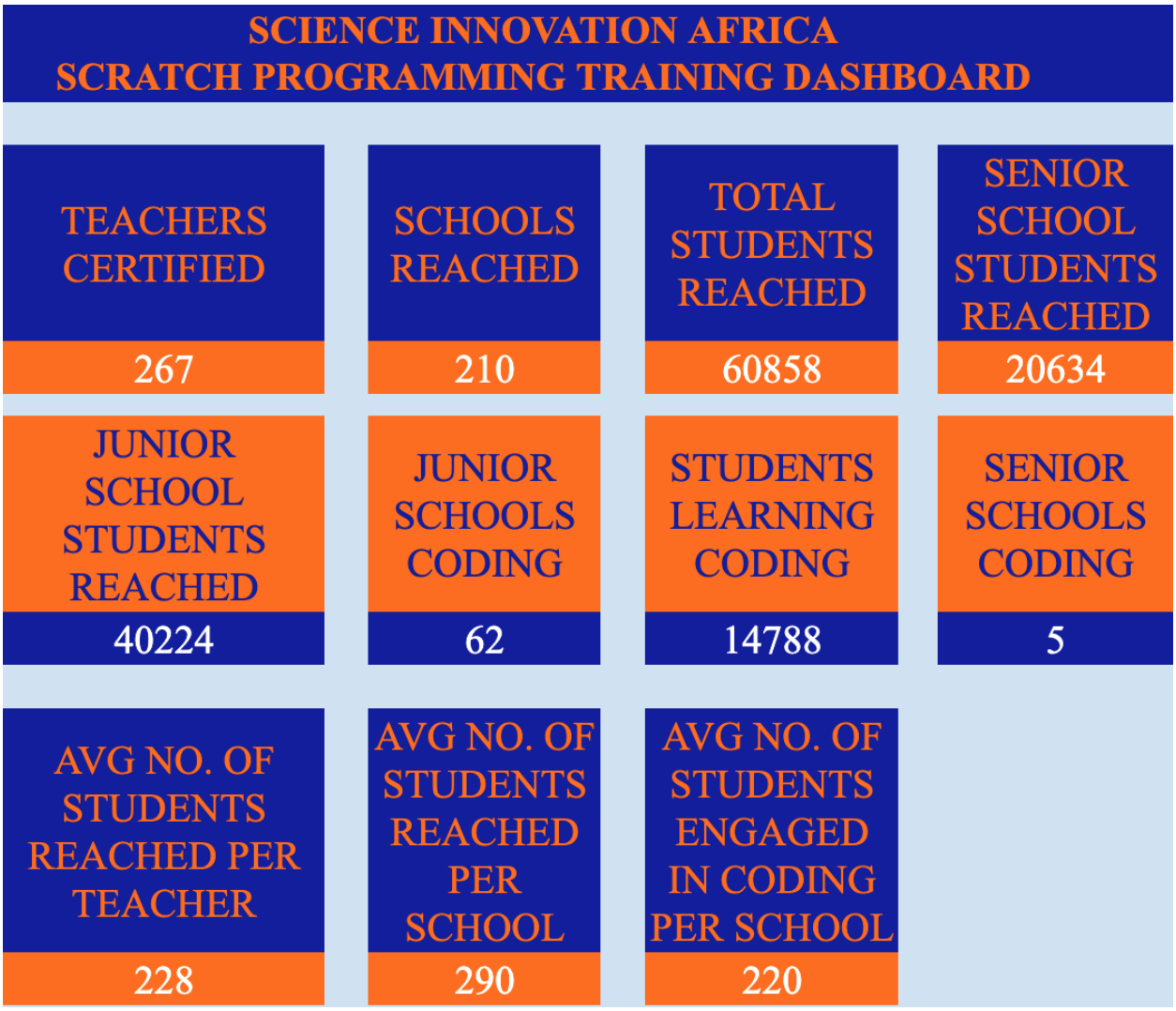
Comparison of Schools Trained vs Schools Actively Teaching Scratch Programming by Cohort.

The program also extends beyond traditional classroom settings. Some schools, such as Kiaigi Primary and Junior School, have established Scratch Programming clubs, where students, guided by their teachers, meet weekly to create Scratch projects.

Students of Kiaigi School scratch coding club

Furthermore, during the 2026 Kenya Science and Engineering Fair, several schools showcased student projects based on Scratch programming, demonstrating the practical application of the skills acquired and fostering creativity among students.

Impact Summary Table



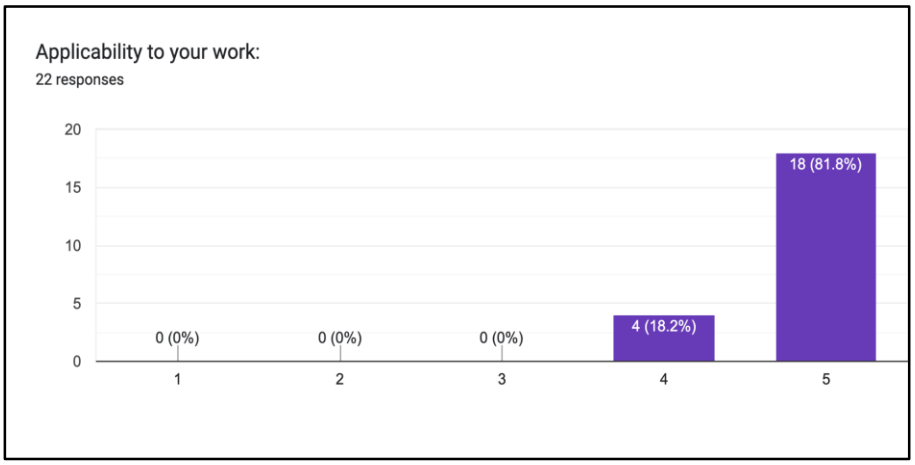
7. FEEDBACK FROM PARTICIPATING TEACHERS

8.1 Overall responses

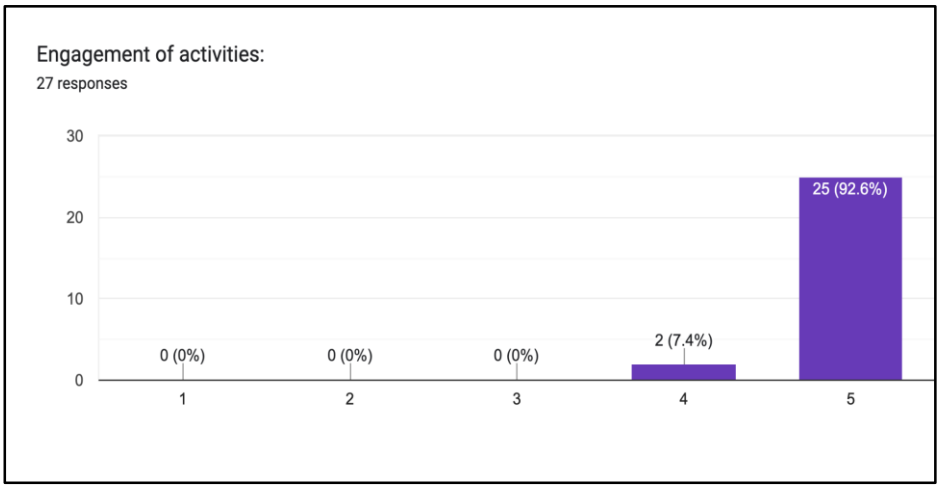
A post training survey was conducted to gather feedback from participating teachers regarding the relevance and effectiveness of the Scratch Programming training. Overall, the responses indicated a high level of satisfaction with the training content, delivery, and practical sessions

Here are some of the feedback from the survey:

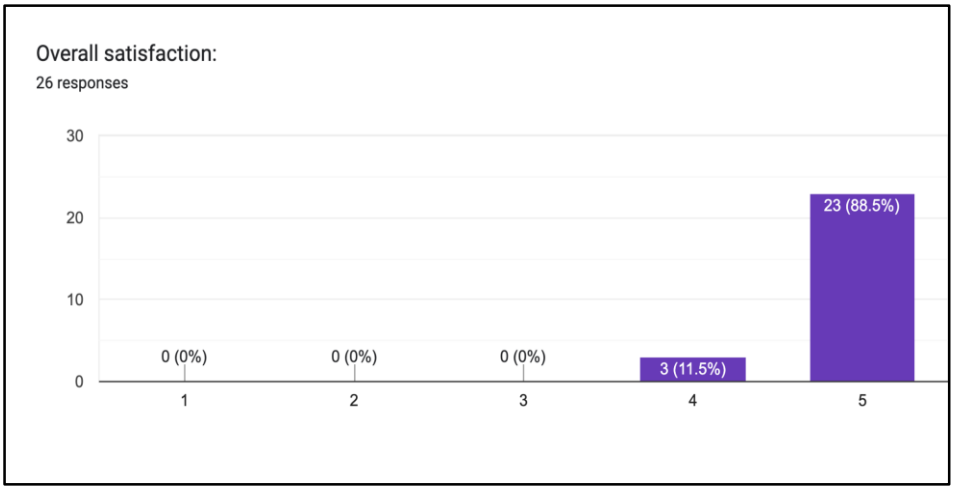
- 95% of teachers felt confident to teach Scratch programming effectively
- 98% found the content relevant and applicable to their work
- 97% were satisfied with the training delivery and methodology



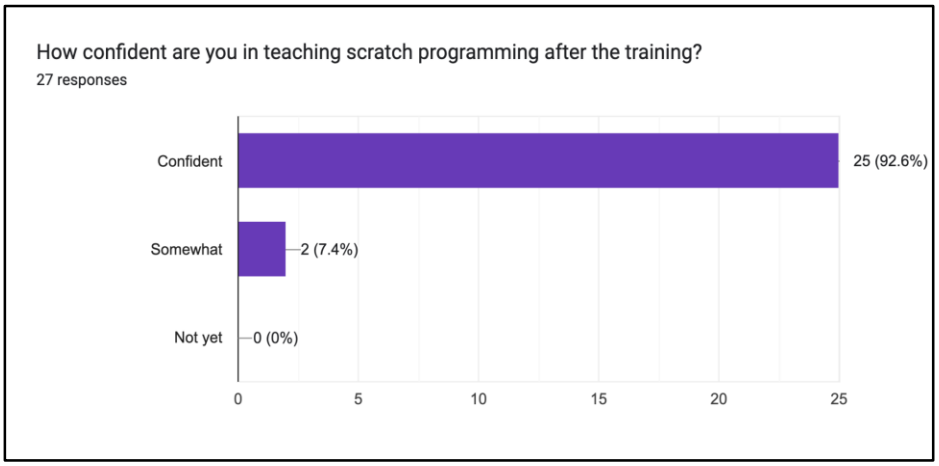
More than 80% of Mathira teachers reported that what they learnt was highly applicable in their day-to-day class work.



More than 90% of the teachers from Nyeri Central and Tetu found our training to be very engaging and hands-on.



88% of the teachers from Othaya and Mukruweni were satisfied with how the training was carried out.



90% of the teachers from Nyeri Central and Tetu were now confident to teach Scratch programming in their schools

8.2 Selected testimonials

Here is what some of the teachers had to say after the training.

"To Scinov Africa, feel highly appreciated for your concern and willingness to train teachers so as to equip them with the very much needed programming skills. Personally really enjoyed the training session and gained so much. Now I am confident that my learners are among the lucky ones. Continue carrying out that noble task. You are heaven-sent. Thank you SCINOV Africa!" **Pharis Mugo, Teacher DEB Karatina Primary and Junior School**

"SCINOV Africa is the best when it comes to scratch programming training. They offer hands-on skills with very interactive coaches and trainers." **Lawrence Wachira, Teacher, Icuga Primary and Junior School**

"Science Innovation Africa is truly a game changer, especially in equipping people with hands-on tech skills." **˜Linet Wambui, Teacher, Kianjau Primary and Junior School**

"This training has transformed how I approach teaching. Coding has helped my students develop logical thinking and creativity." **Anonymous**

"Before the training, coding seemed complicated and meant only for computer specialists. Now I confidently teach it to my students." **Anonymous**

"ICT integration has made my lessons more interactive and engaging." **Anonymous**

Overview

The five day training was highly engaging and well organized. Teachers were provided with breakfast and lunch during scheduled breaks, ensuring a comfortable learning environment.

The training also received **media coverage from Royal Media and GTN**, including a feature on Citizen TV during the 7 o'clock news hour.

Teachers demonstrated exceptional cooperation and initiative, creating leadership roles such as class president, timekeeper, and welfare officer. These roles encouraged responsibility, teamwork, and active participation throughout the training.

Huko Nyeri TSC yahimizwa kushirikisha mafunzo ya kidijitali kwa JSS

A link to the Citizen TV 10:00 am news broadcast highlighting the training.

8. IMPLEMENTATION CHALLENGES

Despite the positive outcomes, several challenges were reported during programme implementation.

9.1 Limited Digital Devices

Many schools reported that:

- Tablets previously distributed under government initiatives are **no longer functional**.
- Some devices operate with **outdated software that causes slow loading times**.

This limits the effectiveness of coding as a **hands-on learning activity**.

9.2 Inadequate Infrastructure

Most of the schools lack:

- Functional computer laboratories
- Reliable internet connectivity
- Adequate power supply

These limitations restrict the effective integration of digital learning.

9.3 Low Levels of Digital Literacy among Teachers

While the training helped bridge this gap, teachers emphasized the need for continuous digital capacity building programmes

9.4 Lack of Coding Reference Materials

All participating schools reported a shortage of structured coding reference materials for both teachers and learners. This affects lesson preparation and sustained programme implementation.

9.5 Absence of Clear Policy Guidance

Teachers noted the absence of clear national guidelines on:

- Standardized approaches to ICT integration within CBE
- ow schools should support digital empowerment initiatives
- How coding should be implemented in JSS

9. POLICY AND IMPLEMENTATION RECOMMENDATIONS

Based on the findings from the training programme, the following recommendations are proposed.

10.1 Expand Teacher Digital Capacity Building

- Institutionalize **continuous professional development (CPD)** in coding and ICT integration.
- Scale similar training programmes across all counties.

10.2 Strengthen Digital Infrastructure in Schools

- Replace or repair **non-functional tablets distributed under earlier programmes**.
- Provide updated software and technical support.

10.3 Provide Coding Learning Resources

- Develop and distribute **standardized coding textbooks and teaching guides** for JSS teachers and students. SCINOV has authored a Scratch Programming textbook, approved by KICD. We encourage schools to get a copy to provide students with a strong foundation of knowledge and hands-on practice.

10.4 Develop a National ICT Integration Education Policy

The government should consider establishing:

- Clear **policy frameworks for coding education and ICT Integration in JSS**
- Curriculum aligned implementation guidelines

- Teacher support systems for digital learning

10.5 Promote Multi-Sector Partnerships

Encourage collaboration between, Government agencies, Private sectors, Corporate organizations, Development partners and Non-profit organizations.
Such partnerships can help mobilize resources, including functional devices, software licenses, and learning materials, to strengthen the program's impact and significantly accelerate the **digital transformation of education**.

10.6 Establishment of Coding Clubs and Extracurricular Platforms

Encourage schools to create Scratch programming clubs and other extracurricular platforms where students can practice coding outside of classroom hours. This will extend learning beyond formal lessons and promote innovation.

11. CONCLUSION

The **JSS Coding and ICT Integration Training Programme** demonstrates that targeted teacher training can significantly accelerate the adoption of digital learning in Kenyan schools.

With **267 trained teachers representing 210 schools and potentially impacting over 60,000 learners**, the initiative has already delivered meaningful educational outcomes.

The early implementation of coding in **32% of participating schools**, reaching **14,788 students**, confirms the strong potential of teacher-led digital transformation.

Science Innovation Africa calls for **continued support from government agencies, the private sector, corporate bodies, and development partners** to expand this initiative and reach more teachers across **Nyeri County and the entire country**.

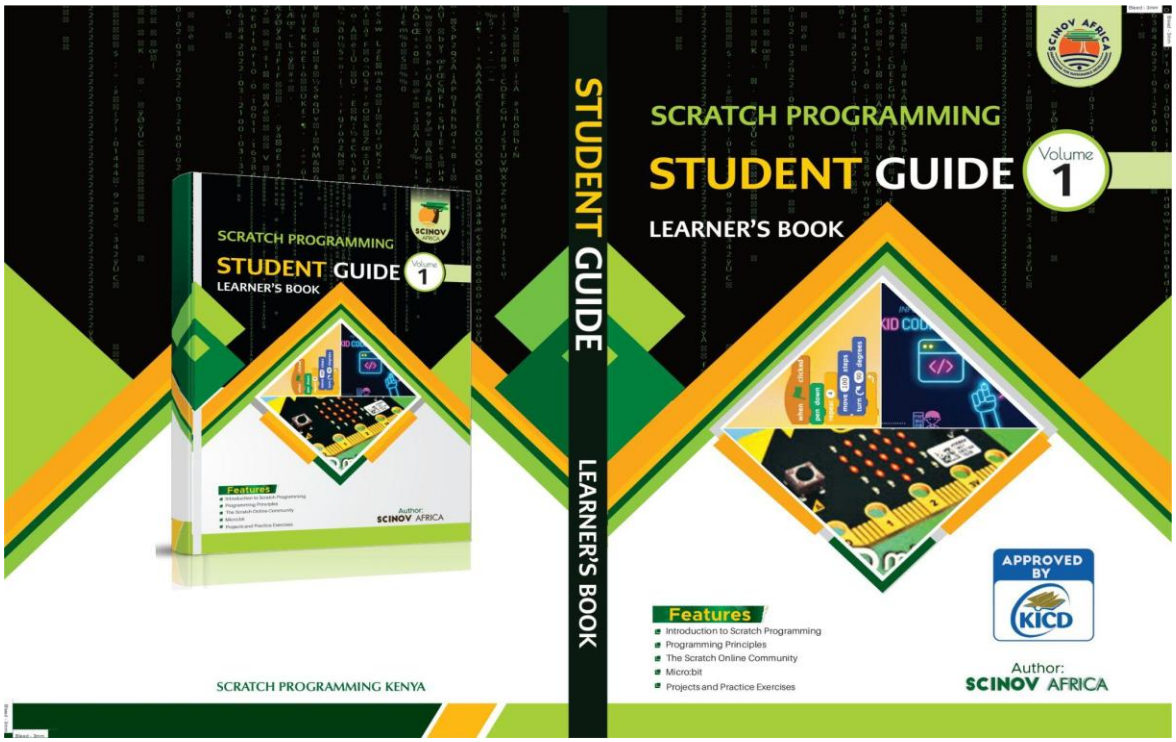
Overall, the training has proven to be a significant step towards strengthening digital literacy and programming skills in schools. It underscores the potential of targeted teacher training programs to empower educators and students, aligning with the objectives of the Competency Based Education (CBE) curriculum and the broader goals of integrating ICT in education.

Empowering teachers with digital skills is one of the most effective pathways toward preparing Kenyan learners for the **demands of the digital economy**.

Annex 1: Curriculum Coverage

The training followed a **KICD approved curriculum** covering:

- Introduction to coding
- Computational thinking
- Coding platforms for beginners
- ICT integration in teaching
- Digital lesson design
- Practical coding activitie



SCINOV AFRICA'S KICD Approved Scratch Programming Text book

Annex 2: Participating Schools

A total of 210 **schools** were represented in the training programme

- AEF Reuben Primary and Junior School
- Airstrip Primary and Junior School
- Amboni Primary and Junior School
- Baraka Peace Primary and Junior School
- Bellevue Primary and Junior School
- Birisha Primary and Junior School
- Burguret Primary and Junior School
- Ccm Nanyuki Primary and Junior School
- Chaka Primary and Junior School
- Chania Primary and Junior School
- Charity Primary and Junior School
- Charity Senior School
- Chehe Primary and Junior School
- Consolata Cathedral Institute
- Consolata Primary and Junior School
- Duncan Ndegwa Secondary School
- Embaringo Primary and Junior School
- Endarasha Primary and Junior School
- Gatei Primary and Junior School
- Gathaithi Primary and Junior School
- Gathinga Primary and Junior School
- Gathiriti Primary and Junior School
- Gathitu Primary and Junior School
- Gathuthi Primary and Junior School
- Gathuini Primary and Junior School
- Gatondo Girls
- Gaturiri Primary and Junior School
- Gaturuturu Primary and Junior School
- Gatumbiro Primary and Junior Secondary School
- Gatundu Primary and Junior School
- Gatuyaini Primary and Junior School
- Gichira Primary and Junior School
- Gikororo Primary and Junior School
- Gikondi Primary and Junior School
- Gitathi-Ini Primary and Junior School
- Gitero Primary and Junior School
- Githakwa Primary and Junior School
- Githiru Primary and Junior School
- Githwariga Primary and Junior School
- Gititu Primary and Junior Secondary School
- Gituiga Primary and Junior School
- Gitugi Primary and Junior School
- Gondo Primary and Junior School
- Guara Primary and Junior School
- Hillfarm Primary and Junior School
- Honi Primary and Junior School
- Icuga Primary and Junior School
- Ihithe Primary and Junior School
- Ithenguri Primary and Junior School
- Itundu Primary and Junior School
- Kabendera Primary and Junior School
- Kagarii Primary and Junior School
- Kagere Primary and Junior School
- Kagumo Primary and Junior School
- Kagwathi Primary and Junior School
- Kahiga Primary and Junior School
- Kahuti-Ini Primary and Junior School
- Kaiguri Primary and Junior School
- Kambi Primary and Junior School
- Kamiruri Primary and Junior School
- Kamuyu Primary and Junior School
- Kangaita Primary and Junior School
- Kangocho Primary and Junior School

- Karaguririo Primary and Junior School
- Karangia Primary and Junior School
- Karatina D.E.B Primary and Junior School
- Karichuta Primary and Junior School
- Kariguini Primary and Junior School
- Karima Primary and Junior School
- Karunaini Primary and Junior School
- Karundas Primary and Junior School
- Karuthi Primary and Junior School
- Kiaguthu Primary and Junior School
- Kiaigi Primary and Junior School
- Kiahuko Primary and Junior School
- Kiahuria Primary and Junior School
- Kiambuiri Primary and Junior School
- Kiambogo Primary and Junior School
- Kiamuiru Primary and Junior School
- Kiandere Senior School
- Kiandu Primary and Junior School
- Kiangumba Primary and Junior School
- Kianjau Primary and Junior School
- Kianjogu Primary and Junior School
- Kiaragana Primary and Junior School
- Kiaragana Senior School
- Kiawaithanji Primary and Junior School
- Kiboya Primary and Junior School
- Kibutio Primary and Junior School
- Kiganjo Primary and Junior School
- Kigumo Primary and Junior School
- Kihatha Primary and Junior School
- Kihigo Primary and Junior School
- Kihingo Primary and Junior School
- Kihora Primary and Junior School
- Kihuhiro Primary and Junior School
- Kihuro Primary and Junior School
- Kihuyo Primary and Junior School
- Kimuri Senior School
- King'ong'o Primary and Junior School
- Kinyaiti Primary and Junior School
- Kiria Primary and Junior School
- Kiriini Primary and Junior School
- Kirimara Primary and Junior School
- Kiriti Primary and Junior School
- Kiru Primary and Junior School
- Kwanderi Primary and Junior School
- Laburra Mixed Day Senior School
- Laburra Primary and Junior School
- Lachuta Primary and Junior School
- Lamuria Primary and Junior School
- Lamuria Senior School
- Lbarok Primary and Junior School
- Likii Primary and Junior School
- Lusoi Primary and Junior School
- Macharia Primary and Junior School
- Magutu Girls High School
- Magutu Primary and Junior School
- Mahiga Primary and Junior School
- Mairwe Primary and Junior School
- Manyatta Primary and Junior School
- Mathaithi Primary and Junior School
- Mathari Primary and Junior School
- Mathakwa-Ini Primary and Junior School
- Mathingira Solio Ranch Primary and Junior School
- Mbirithi Primary and Junior School
- Miagayu-Ini Primary and Junior School
- Mihato Primary and Junior School
- Miiri-Ini Primary and Junior School
- Milimani Primary and Junior School
- Mirichu Primary and Junior School
- Missions of Hope International
- Mitero Primary and Junior School
- Mlima Kenya Senior School
- Moi Nyeri Complex Primary and Junior School
- Mt Kenya Primary and Junior School
- Mugunda Primary and Junior School

- Muirungi Primary and Junior School
- Munaini Primary and Junior School
- Mureru Primary and Junior School
- Muringato Primary and Junior School
- Muthangira Primary and Junior School
- Muthuini Primary and Junior School
- Mwangaza Primary and Junior School
- Mwenji Primary and Junior School
- Mwicwiri Primary and Junior School
- Mwireri Senior School
- Mwiyogo Primary and Junior School
- Mwiyogo Senior School
- Nairutia Primary and Junior School
- Nanyuki Junior Primary and Junior School
- Naromoru Boys Senior School
- Naromoru Mixed Senior School
- Naromoru Primary and Junior School
- Naromoru Township Primary and Junior School
- Ndiriti Senior School
- Ngaini Primary and Junior School
- Ngaru Primary and Junior School
- Ngooru Primary and Junior School
- Njatheini Primary and Junior School
- Njeng'u Senior School
- Njengu Primary and Junior School
- Nyamachaki Primary and Junior School
- Nyange Primary and Junior School
- Nyeri Good Shepherd Academy
- Observation Hill Senior School
- PCEA Nanyuki Girls Primary and Junior School
- Riamukurwe Primary and Junior School
- Rueben Center Primary and Junior School
- Ruirii Primary and Junior School
- Rurichu Primary and Junior School
- Rware High School
- Sagana Primary and Junior School
- St Christophers Primary and Junior School
- St Moses Primary and Junior School
- St Paul's Githakwa Secondary
- St Paul Kinyaiti Senior School
- St Teresa's Primary and Junior School
- St Thomas Catholic Academy
- St. Augustine Embaringo Senior School
- St. Faustina Mweiga Senior School
- St. John Kamiruri Senior School
- St. Joseph Simbara Senior School
- St. Joseph's Mahiga Primary and Junior School
- St. Regina Nairutia Senior School
- St. Thomas Ruirii Senior School
- Tanyai Primary and Junior School
- Tetu Boys Primary and Junior School
- Tetu Girls Primary and Junior School
- Thageini Primary and Junior School
- Thangathi Primary and Junior School
- Thunguma Primary and Junior School
- Thunguri Primary and Junior School
- Wamagana Primary and Junior School
- Wang'ata Primary and Junior School
- Watuka Primary and Junior School
- Wendiga Primary and Junior School