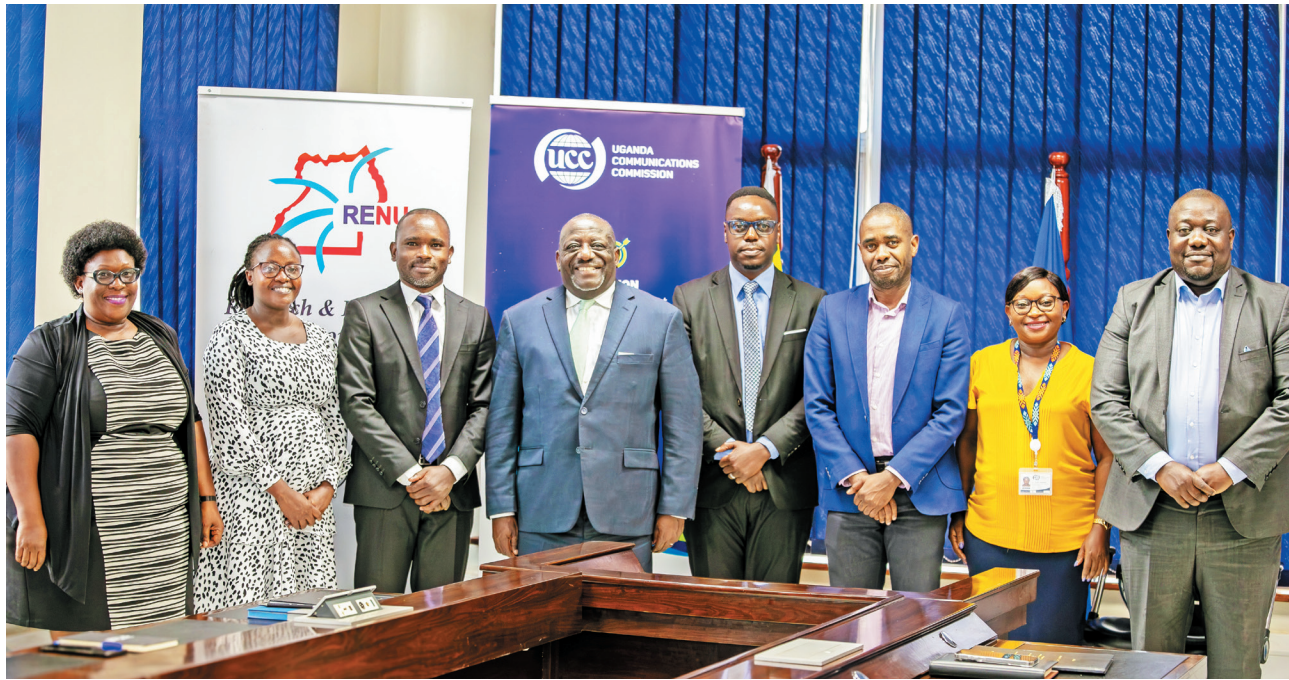


Digitising Schools with High-speed Internet Under the RENU-UCC Partnership



Hon. George William Thembo Nyombi together with the RENU team after the signing ceremony at the UCC Secretariat in Bugolobi.

In Uganda, the education landscape is undergoing rapid transformation fuelled by technological advancements and an increasing focus on digitisation. The new secondary school competence-based curriculum requires schools to embed Information and Communication Technology (ICT) in learning and teaching. In addition, it advocates for student-centred learning that requires less dependence on teachers in problem-solving, which has inevitably increased the demand for access to online resources among students and the integration of e-learning. This demand for digitisation and ICT integration has put a lot of pressure on schools to have a reliable Internet connection, which many government schools may ordinarily not afford, creating a significant digital divide between such schools and their peers.

One notable initiative spearheaded by the Uganda Communications Commission (UCC) is the provision of high-speed Internet to selected schools under the Uganda Communications Universal Service and Access Fund (UCUSAF), which aims to enhance learning through improved Internet connectivity. This Fund seeks to equip learners with essential digital skills, improve teaching quality, and boost overall learning outcomes, all of which align with Sustainable Development Goal 4 (Quality Education).

On 6th January 2025, the Research and Education Network for Uganda (RENU) and the Uganda Communications Commission (UCC) renewed their partnership to extend Internet connectivity and other ICT-based services to 85 more secondary schools across Uganda. This project, set to begin in 2025, builds on the success of our previous collaborations with UCC, through which 144 schools were connected to RENU's reliable, affordable, and high-speed Internet.

The project is a product of shared interests between RENU and UCC, i.e., enabling quality research and education through modern

technologies. RENU's collaboration on this project is in line with the organisation's mission, "To facilitate collaboration among Uganda's research and education institutions for knowledge creation, sharing and utilisation, through the provision of advanced and secure connectivity and relevant services." In line with this mission and social purpose, RENU will provide the schools with high-quality, reliable, and high-speed Internet connectivity at an affordable cost and equip the ICT Heads with the basics of network management.

During the agreement signing ceremony, which took place at the UCC Secretariat in Bugolobi, the Executive Director of UCC, Hon. George William Thembo Nyombi was full of praises for the fruitful collaboration. "Our collaboration with RENU has been truly invaluable! It goes back long before the schools' connectivity projects—to a time when we were striving to lower the cost of bandwidth, a challenge that RENU played a pivotal role in addressing. Over the years, RENU has consistently delivered exceptional results, reinforcing our confidence that this partnership will continue to grow and drive greater impact."

Mr. James Beronda, Director of UCUSAF at UCC, who was also in attendance, commended the work of the two entities. He acknowledged that the relationship between the two entities started at the time RENU was established, and gave insights on why RENU continues to be a critical ally for UCC. "We like the relationship we have with RENU because of their close touch with the schools, e.g. the capacity building RENU offers to schools has made a very big difference in improving the Internet experience at these schools."

The RENU team, led by the Chief Executive Officer (CEO), Nicholas Mbonimpa, expressed deep appreciation for the trust UCC has placed in them and reaffirmed their commitment to maintaining the highest standards of quality in their delivery. "We deeply appreciate UCC's efforts under UCUSAF and the new partnership for the 85 schools, which reflects the trust UCC has in our work. Our goal is to complete the

connection of these schools by the end of March 2025. With this addition, the total number of schools connected through our collaboration with UCC will rise to 229. However, this is a tiny fraction of the schools across the country still struggling with Internet connectivity and digital services. There is much more work still to be done, and RENU remains committed to delivering quality and impactful solutions."

For the past four years, UCC has partnered with RENU to provide schools with fast and reliable Internet access. This collaboration continues to play a vital role in bridging the digital divide within Uganda's education sector, ensuring that students and teachers can leverage the power of the Internet for enhanced educational experiences.

This partnership is crucial in advancing the integration of ICT in Uganda's education system through the UCUSAF initiative. The integration of ICT has the potential to significantly improve performance in STEM (Science, Technology, Engineering, and Mathematics) subjects by enabling easy access to interactive learning tools, access to diverse content, and the inclusion of digital resources within the secondary school curriculum. RENU's role in this partnership is to deliver high-quality, reliable, and affordable Internet connectivity to schools while also building the technical capacity of IT officers in these schools to manage and maintain clean Local Area Networks (LANs). This ensures that schools can derive maximum benefit from the RENU backbone network, supporting their digital transformation journey.

Fruits of the Partnerships

Initially, only a small percentage of schools were connected to RENU's network. However, through the partnership with UCC, RENU managed to connect 144 schools between 2019 and 2023. With improved Internet access, it has been possible to equip these schools with a range of digital learning tools, including e-learning platforms, web hosting services, and eduroam, the free, secure, and trusted Wi-Fi. These digital tools are vital in fostering a robust digital learning environment. RENU has provided capacity building programs for ICT Heads in various technical areas in these schools, ensuring that they are equipped with the necessary skills to manage and sustain digital infrastructure. Below, we elaborate more on some of the successes realised in the last four years.

Elevated E-learning

The initiative has supported the creation of e-learning platforms in several connected schools, such as Lira Town College, promoting modern teaching methods. Thanks to the strong and reliable Internet provided under the RENU-UCC partnership, the school successfully implemented two virtual projects. In 2021, the school launched the Virtual E-learning Workshop and Collaboration under the theme, "Education as a Humanitarian Response: Using E-learning to Accelerate Learning in the COVID-19 Era." This initiative culminated in the creation of a website and e-learning platform for Lira Town College, and students from various schools also utilised these platforms to access learning materials remotely. As a result, students are better equipped for a future that requires solid digital literacy skills. This transformation has turned traditional classrooms into digital hubs, providing students with access to a vast array of educational resources. "Since we got an Internet connection from RENU, Lira Town College has improved in many areas. The staff are happy, especially with the eduroam service, and academic performance has improved significantly. For example, in the 2023 Uganda Certificate of Education (UCE) examination, we got 28 students passing in division one and sent over 70 students that passed the Uganda Advanced Certificate of Education (UACE) examination to universities that year. This is possible because teachers have a reliable Internet connection for research, studies and socialisation. Reliable Internet is the magnet that attracts teachers to school, even during school holidays. We have also allowed community members to access the Internet, especially university students. RENU is the best Internet Service Provider (ISP) we have had in 15 years", said Emmanuel Angoda, Head of ICT, Lira Town College.

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Hon. George William Thembo Nyombi, Executive Director, UCC

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Nicholas Mbonimpa
Chief Executive Officer, RENU

Increased Online Presence

With access to a reliable Internet connection, it has been easy for many of these schools to be onboarded on digital platforms, and this has enabled the students and staff to connect with the online audience as seen in the adoption of such services like web hosting and domain registration with some of the early adopters including Iganga Girls Secondary School, Kansanga Seed Secondary School, Muni Girls Secondary School, Ishaka Adventist College, Kisubi High School, Kitebi High School, Mbarara High School, Duhaga Senior School and Entebbe Secondary School.

Collaboration Through Virtual Seminars

The adoption of virtual seminars is one of the early benefits that came with the connection of these schools. With a reliable Internet connection, most schools adopted our Zoom and BigBlueButton (BBB) web conferencing platforms. These platforms helped the schools to participate in virtual seminars along with schools that are ranked high in performance, facilitating high-level collaboration, knowledge sharing, and, above all, tremendously cutting down the costs involved in organising physical seminars. This means that the number of schools and students that can participate in a single seminar is much bigger. For example, in 2024, the Holistic e-Learning Project (HeLP) organised a series of virtual seminars that achieved a remarkable average participation of 8,984 students from 140 secondary schools across the country—numbers that would be nearly impossible to achieve in a single physical seminar. UCC-supported schools connected to the RENU network have also shown notable participation in these events; for instance, in 2023, Gulu Army Secondary School actively engaged in a Mathematics seminar with 242 students, something that wasn't possible in the near past.

Furthermore, the RENU Zero-rated Mobile Access service has enabled students from these schools to participate effectively in these virtual seminars, even during holidays, at zero cost. The service facilitates students' access to the schools' websites and e-learning platforms without loading data bundles, further facilitating e-learning. This was most helpful during the COVID-19 pandemic when students were away from the school premises, studying remotely. During this time, many families were constrained with providing even the basic needs. Buying data bundles was too much of a luxury for most of the homes. The Zero-rated Mobile Access service facilitated students, including those from low-income families, to participate in such virtual seminars, and this continues to keep such students involved in virtual learning in the years after the pandemic.

Enhanced Research and Collaboration with eduroam

To further support the Internet needs of UCC-supported schools, RENU launched the Free Wireless Access Points (APs) Project on 23rd September 2021. This initiative facilitated the extension of the Internet and deployment of eduroam to areas where more users could access it, e.g., the administration blocks and staffrooms. Entebbe Secondary School became the first beneficiary of this project.

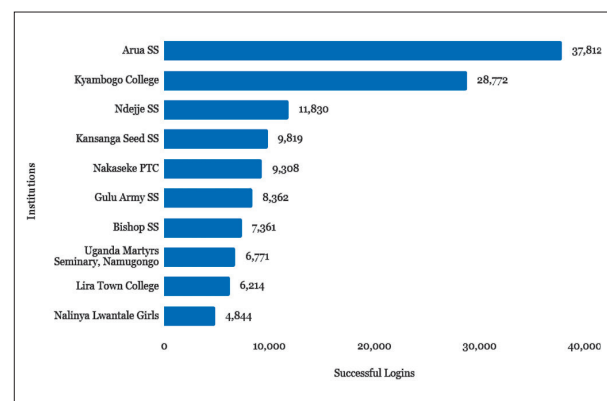
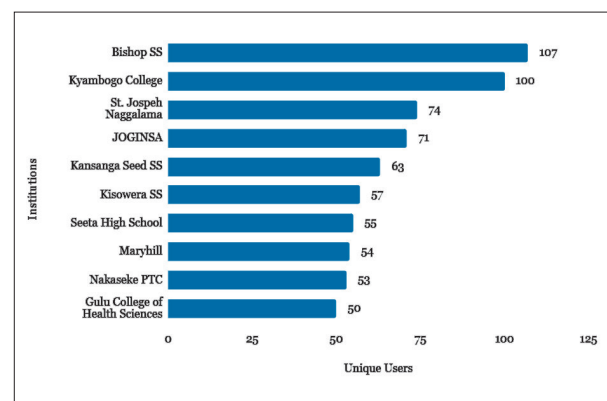
eduroam stands for education roaming, and it is the free, secure, and trusted Wi-Fi that is transforming the lives of students and staff while at school and off-campus. eduroam enables students and staff to connect to the Internet anywhere, both on and off-campus, while using their home institution's credentials. With the provision of eduroam to these schools, students and staff are efficiently conducting research across a wide range of educational topics, alongside connecting with their peers in the research and education community.

Additionally, through RENU's Managed Identity Provider (IdP) service (which was developed to support member schools that can't afford virtual machines and a RADIUS server to join the eduroam service), most of the UCC-supported schools have been connected to eduroam. This connection allows users to access educational resources both on-campus and remotely, enabling a seamless teaching and learning experience. As a result,



students and staff from previously underserved areas now enjoy equal access to educational resources, helping to create a more equitable education system. Furthermore, through RENU's Metro eduroam service (off-campus eduroam), teachers and students can easily access their institution's resources and conduct research.

The graphs below show the top 10 Metro eduroam user UCC-supported schools in terms of successful logins and unique users as of December 2024.



By August 2024, 132 schools were connected to eduroam, contributing 2,051,896 successful logins and 32,469 unique users to eduroam usage in Uganda. The tables below show the top 10 eduroam user schools along with the RENU-UCC project in terms of successful logins and unique users as of August 2024.

Top 10 eduroam user schools as per successful logins

School	Successful logins
Maryhill High School	107,304
Muni Girls Secondary School	88,174
Gulu Army Secondary School	74,477
Masindi Secondary School	66,293
Kansanga Seed Secondary School	57,580
Ngora Girls Secondary School	56,618
Mbarara High School	53,799
Gulu High School	53,034
Lira Town College	51,508
Arua Public Secondary School	5,0267

Top 10 eduroam user schools as per unique users

School	Unique users
Lira Town College	187
Maryhill High School	115
Gulu Army Secondary School	101
Duhaga Secondary School	95
Kyambugo College	91
Mpanga secondary School	88
Mbarara High School	82
Gulu High School	66
Kansanga Seed Secondary School	64
Kisowersa Secondary School	64

Improved Technical Abilities of School ICT Staff

Every year, RENU conducts capacity building programs in the form of workshops, forums, and online webinars (<https://renu.ac.ug/capacity-building/>), designed to enhance the technical skills of the network and systems engineers of member institutions, including ICT Heads of the UCC-supported schools. These workshops equip teachers with the skills and knowledge needed to effectively integrate technology into their teaching methods. Also, these trainings are key in enhancing the basic skills of the ICT Heads to maintain their schools' Local Area Networks (LANs). Initially, the schools had technical challenges in managing their networks because most of them did not have dedicated technical ICT staff, and most of the networks were being managed by teachers. Through capacity building programs that run throughout the year, RENU has supported several UCC-supported schools by improving their staff's technical capacity to manage the school networks. For example, in 2023, RENU held a Scalable Campus Network Design Training Workshop for ICT Heads from member schools in the Central Region at Mengo Senior School from 15th to 18th May, which 19 participants attended. Also, RENU held an online NOC webinar for schools on 15th February 2024, which was attended by 40 ICT Heads from member schools across the country. As a result, this initiative has boosted the capabilities of the ICT Heads of UCC-supported schools, enhancing the overall experience for students and staff.

Digital Inclusion

One standout beneficiary of the RENU-UCC partnership is the Busega Community School for the Deaf and Blind. With stable Internet provided by RENU, the school has been able to implement online education programs, including teaching American Sign Language, which has greatly enriched the learning experience for students. Furthermore, reliable Internet access has enabled students to access relevant academic resources and recreational content that helps alleviate stress, especially for those facing personal challenges such as parental neglect.

RENU has also facilitated digital inclusion through equipment support to schools, e.g. Entebbe Secondary School, to expand Internet access within the school campuses. As a result, we have seen students and pupils from rural schools share virtual rooms with learners from schools considered to be of a higher standard, all learning together. This is something that UCC and RENU would like to see happen more often through Internet connectivity initiatives to bridge the rural-urban digital divide.

Looking Ahead

As we usher in another project with UCC to connect more schools to our high-speed Internet connection, we believe it will yield big and positive impacts in driving academic performance, research, and innovation in Uganda's education landscape. We will continue to leverage Internet connectivity to shape a future where every student can access the transformative power of Information and Communication Technologies (ICT) regardless of location.

Here's to more years of transforming Uganda secondary schools' research and education landscape.

About RENU

RENU is a not-for-profit membership-based organisation that aims to enhance collaboration among research and education institutions by providing high-speed Internet connectivity and other ICT services uniquely designed for the research and education community. Founded in 2006 by Vice Chancellors of Uganda's universities and Executive Directors of Uganda's research institutions, RENU's first focal issues were the reduction of the cost of international bandwidth and the improvement of the quality of Internet connectivity for member institutions. Affordability and the quality of the Internet remain high on RENU's agenda.

Since acquiring a license from UCC in 2010, RENU has connected over 800 sites from a total membership of 350 institutions, including schools, universities, Other Tertiary Institutions (OTIs), health facilities, and research organisations.

About UCC

UCC was established to implement the provisions of "The UCC Act 2013" in accordance with the laws of Uganda, with the principle goal of developing a modern communications infrastructure in Uganda, in conformity with the operationalisation of the Telecommunications Policy. UCC's primary mandate is to regulate the Communications sector, including telecommunications, broadcasting, radio, postal, data, and infrastructure.

