

Reneal International Education Outreach, Inc.

TRANSFORMING LIVES THROUGH TECHNOLOGY AND EDUCATION

Computerization Strategy for Government Secondary Schools

Updated December 2024

Current Impact Statistics (As of December 2024)

Metric	Count
Schools Installed	120+
Districts Reached	23
Regions Covered	11
Computer Labs Installed	122
Students Reached	55,000+

Regions We Serve:

Arusha, Manyara, Dodoma, Tanga, Mara, Iringa, Mtwara, Kilimanjaro, Lindi, Pwani, Mbeya

Leadership

Neal and Rene Bierbaum - Co-Founders

David Nyangaka - Tanzania Country Director

Arusha Region-Reneal Partnership

Goal: Installing computer labs in government secondary schools

Key Design Features:

- Ubuntu, Open Source Software
- Extensive off-line educational content
- User-friendly interface, system admin tools, built-in diagnostics, and seamless integration
- Cost, maintainability, and reliability goals met through a client-server approach

System Attributes

Low-cost:

- Free, legal Open Source software
- Client-server architecture so older computers can be used

Low-maintenance / High reliability:

- No viruses
- Centralized software, no local hard disk or software failures
- Robust server design

Tailored for schools:

- Teacher/student accounts and file storage
- Educational content specific for Tanzania schools

Form 4 National Exam Results (Updated 2024)

Year	# of Schools	% of Schools	A	B	C	D	F	% Passing	Total Students
2019									
2020	2	8%	0	2	5	6	8	62%	21
2021	3	8%	0	15	23	2	0	100%	40
2022	4	7%	1	2	36	9	7	87%	55
2023	13	14%	7	22	93	62	26	88%	210
2024	17	18%	16	34	97	43	22	90%	212

Form 2 National Exam Results (Updated 2024)

Year	# of Schools	% of Schools	A	B	C	D	F	% Passing	Total Students
2019	10	50%	0	3	36	116	139	53%	294
2020	10	38%	0	0	21	75	108	47%	204
2021	13	33%	0	7	104	120	89	72%	320
2022	17	30%	0	14	78	196	251	53%	539
2023	23	24%	6	37	280	241	109	84%	673
2024	28	29%	16	87	341	269	198	78%	911

Key Observations:

- Steady increase in the number of Reneal schools participating in national exams
- Form 4 passing rate improved to 90% in 2024, with 17 schools participating
- Form 2 results show 78% passing rate with 28 schools participating in 2024
- Total of 1,123 students benefited from Reneal computer labs during 2024 exams

User Features

Applications Programs:

Office suite, photo editing, video editing, webpage design, desktop publishing, computer-aided design, programming, etc.

Educational Programs:

Numerous educational programs, particularly for math and science

Off-line Educational Content:

- Books and literature
- Movies and educational videos
- Offline Wikipedia
- National Exam papers
- Tanzania curriculum notes
- PhET science simulations
- Khan Academy videos (English and Kiswahili)

Collaboration Features:

- TeachersShared and AllUsersShared folders for permission-controlled content sharing
- Epopes classroom management tool for screen sharing and monitoring student work
- Customized program for shared video streaming

Keys to Sustainability

Partnership with Local Government

- Arusha Region supports Reneal with school selection, frequent communication with school heads and computer teachers, and on-going monitoring
- Joint planning guides computer lab upgrades and responses to attrition and theft

Training:

- Tutorial videos and slide decks for computer teachers
- Teacher Orientation offered for all teachers
- Reneal System Admin Manual provided to each school

Maintenance:

- Automatic daily backups to a dedicated second disk
- Virtual Private Network (VPN) for remote maintenance when Internet is available
- Local trained technicians available for maintenance and training

Troubleshooting:

- Built-in diagnostic, troubleshooting, and repair program runs automatically each hour
- Built-in performance and usage data collection for monitoring

Expandability:

- Software upgrades require a single operation on the server
- New educational content can be added easily to the server
- New clients can easily be added to the system

Risks and Issues

- Finding time for Computer Studies and general student computer use in the daily timetable
- Time-sharing of lab between Computer Studies and computer-aided instruction (CAI) in other subject areas
- Untapped opportunity to use computers to teach in other subject areas – teachers would benefit from training in CAI methodology
- Microsoft-centric focus of Computer Studies National Exam – although students may excel at computer use, they may do poorly in the National Exam practicals because of focus on Microsoft
- Computer lab security – about a third of schools have experienced equipment theft; continuous oversight is critical
- "Temporary" removal of items by teachers from the computer lab
- The Linux user interface has been customized to look like Microsoft Windows, but some teachers do not have the time or interest to learn a new system
- Schools sometimes fail to report computer lab problems and issues in a timely fashion
- Because Reneal relies on donations of used computers to serve as clients, expansion is both limited and unpredictable

School Preparation

What Reneal Provides	What School Provides
<ul style="list-style-type: none">• Powerful server computer• Gigabit network switch• Up to 20 used computers• Laptop, adapter, and mouse• Network cable/connectors• UPS and voltage stabilizer• Power extensions• Shipping costs• Training and orientation• On-going support	<ul style="list-style-type: none">• Classroom for lab• Computer teacher(s)• Security (window grills, heavy door, locks)• Tables for computers• Chairs for students• Electricity outlet(s)• Commitment to use and care for the system

Additional Needs and Support

- Ministry to help allocate ICT teachers to beneficiary schools
- Connecting Reneal labs to computer-aided-instruction experts
- Identify other NGOs or governments that can assist with obtaining client computers (new or used)
- Consider Computer Studies curriculum and National Exam content – what best leverages the lab resources plus prepares students?
- Printer and photocopier, video projector for schools
- Free internet connectivity
- Assist financially with locally-obtained equipment (Cat6 network cable, UPS, etc.)
- Assist with VAT and customs duty waivers

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