

# Occupation and Learning Process

WEEK 5 - Career Pathways and Learning Journey

University: Rwanda Polytechnic - Tumba College

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# Warm up

- In 5 minutes, turn and talk.
  - What are the available paths for career progression?
  - What are the expectation after the completion of this program?
  - What are the possible jobs to apply for?
  - What are the usual positions for this sector?
  - Few students will share what you discussed to the entire class.
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# Objectives

At the end of this session, students will be able to:

1. Describe the qualifications for Technical Service Sector
  2. Describe and classify possible jobs for the Sub-Sector
  3. Differentiate various job position in various contexts
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# Rationale

- This session will focus on the information related to the emphasis of developing a skilled, innovative, and competitive workforce capable of supporting industrial growth and technological advancement.
  - By understanding qualifications, job classifications, and professional roles within the Technical Service Sector, students gain practical knowledge that prepares them for decent employment and entrepreneurship.
  - This approach supports the country's goal of creating a knowledge-based economy where technical skills drive sustainable development and regional integration.
  - Therefore, technical professionals are required to provide responses to technology and economic development.
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# 1. Qualifications for the Sector

- The Technical Service Sector in Rwanda plays a vital role in supporting the country's industrialization, digital transformation, and sustainable development agenda.
  - It encompasses a broad range of professional and technical fields including engineering, information and communication technology (ICT), electronics, telecommunication, construction, energy, and mechanical services.
  - It provides essential services that enable productivity across all industries from maintaining infrastructure and managing ICT systems ensuring the functionality of manufacturing and transport systems.
  - It is a strategic pillar for achieving a knowledge-based and innovation-driven economy, emphasizing the importance of skilled technicians, engineers, and technology specialists in national development.
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# 1. Qualifications for the Sector cont'd

- It is primarily driven by Technical and Vocational Education and Training (TVET) institutions, which prepare a competent workforce through competency-based training aligned with labour market demands.
- Rwanda Polytechnic and other accredited private higher learning institutions were assigned a mandate to produce graduates with hands-on technical skills in areas such as electrical installation, electronics repair, network systems, and telecommunication engineering. The sector has critically reduced unemployment and promoting entrepreneurship, especially among youth.

(Graduate Tracer Survey Report 2024 Supported by the Priority Skills for Growth Programme., Republic of Rwanda via the Labour Market Information System, LMIS, Government of Rwanda, 2024.)

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# 1. Qualifications for the Sector cont'd

- Due to collaboration between public institutions and the private sector to enhance service delivery, connectivity, and innovation, the sector has faced tremendous upgrade to satisfy all the needs around.
  - Regionally, Rwanda's integration into the East African Community (EAC) facilitates mobility for skilled technicians and engineers, aligning national qualifications with regional frameworks. Collectively, these initiatives position the technical service sector as a dynamic engine for Rwanda's socio-economic transformation and industrial competitiveness. (Graduates' and Schools' Managers' Perceptions of the Role of Industrial-Based Training in Technical Vocational Education and Training, Rwanda., Michael Rwibasira Tusiime; Irénée Ndayambaje; Kizito Ndiokubwayo, African Journal of Governance and Development, Vol. 11, Issue 1.2, 2022, pg. 351-366.)
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# 1. 1. Qualifications plans

- Rwanda TVET Policy focuses on building a competent, innovative, and employable workforce to meet the country's socio-economic development goals through competency-based approach to align learning outcomes with labour market needs.
  - This was found essential for industrial growth, job creation, and poverty reduction.
  - It also emphasizes partnerships between TVET institutions and industries to ensure training remains practical and up to date with technological trends.
  - For technical service sector, the policy establishes the framework for producing skilled technicians and professionals in areas such as electronics, telecommunications, ICT, and engineering services. (Rwanda TVET Policy, Ministry of Education, Government of Rwanda, 2015.)
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# 1. 1. Qualifications plans cont'd

- Vision 2050 provides Rwanda's long-term roadmap for achieving high living standards and a knowledge-based economy. It envisions a future where Rwandans are technologically skilled, innovative, and competitive globally.
  - The document stresses the importance of STEM education, digital transformation, and technical expertise as foundations for industrialization and economic growth.
  - Vision 2050 prioritizes investment in technical services, such as infrastructure development, ICT systems, and manufacturing, to create sustainable jobs and improve productivity. It positions the technical service sector as a key driver of Rwanda's industrial and technological advancement toward becoming an upper-middle-income country by 2035 and a high-income nation by 2050. (Vision 2050, Ministry of Finance and Economic Planning (MINECOFIN), Government of Rwanda, 2020.)
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# 1. 1. Qualifications plans cont'd

- The NSDEPS (2022–2030) outlines Rwanda’s national approach to enhancing skills development, employability, and workforce competitiveness. It addresses existing skills mismatches in key sectors including technical services, ICT, construction, and energy and promotes workplace learning, internships, and apprenticeships.
  - The strategy supports collaboration between government, private sector, and academia to strengthen youth employability and entrepreneurship and takes technical service sector as vital for national transformation, recommending training and upskilling in technological demands with female participation and inclusivity in technical and engineering fields. (National Skills Development and Employment Promotion Strategy (NSDEPS 2022–2030), MIFOTRA, 2022.)
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# 1. 1. Qualifications plans cont'd

- The (SRMP) was designed to transform Rwanda into a digitally enabled, knowledge-based society. It integrates ICT into all sectors of the economy including education, health, governance, agriculture, and infrastructure to improve service delivery and productivity.
  - For the technical service sector, the SRMP highlights the need for ICT professionals, technicians, and engineers to develop and maintain national infrastructure, such as broadband networks, data centres, and smart city systems. It also promotes the use of e-learning, e-government, and ICT entrepreneurship, which directly enhance opportunities in technical service and telecommunication sub-sectors. (Smart Rwanda Master Plan 2015–2020, Ministry of ICT and Innovation, 2015.)
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# 1. 1. Qualifications plans cont'd

- The ICT for Rwanda 2024 strategy continues the momentum from the Smart Rwanda Master Plan and outlines Rwanda's digital transformation priorities.
  - It focuses on strengthening digital infrastructure, building digital skills, promoting innovation, and fostering ICT-driven employment. The strategy identifies the technical services workforce including network engineers, software developers, cybersecurity experts, and electronics specialists as critical to achieving a digitally resilient economy.
  - It calls for integration of ICT skills into all levels of education, support for local innovation ecosystems, and private-sector partnerships to advance national digital capability. (ICT for Rwanda 2024, Rwanda Information Society Authority (RISA), 2021.)
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## 1. 2. Specific qualifications

- Recall the Technical Services Sector and Electronics and Telecommunication Technology Sub-Sector with qualification as Electronics and Telecommunication Assistant Technologist, Technologist and Engineer.
  - The entry requirements being to have qualification of level 5 in Electronic Services, Telecommunication Technology or General Education with combinations as MPC, MPG, PCM, etc.
  - These are the pathways to be able enter the Advanced Diploma in Electronics and Telecommunication Technology or any other related degree programs as well as continuing to Bachelor of Technology and Master of Technology, etc.
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## 2. Possible jobs

### **Electrical and Electronics Technicians:**

- Typical Employers: Energy utilities like REG, construction companies, and manufacturing plants.
- Requirements: A TVET Diploma or Advanced Diploma in Electrical/Electronics Engineering, hands-on experience with installation and maintenance, and certification in safety standards like OSHA.
- Example: Job in Rwanda often advertises roles for Electricians and Maintenance Technicians in Kigali industrial zones.

### **Electronics Maintenance and Repair Technician**

- Typical Employers: Manufacturing companies, broadcasting stations, hospitals (for medical electronics), and service centres.
  - Requirements: Advanced Diploma in Electronics, experience with circuit testing, soldering, and diagnostic tools; knowledge of embedded systems as added advantage.
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## 2. Possible jobs cont'd

### **ICT Support, Network Technicians, ICT Officers and Network Administrators:**

- Typical Employers: Telecom companies, banks, and ICT service providers, Public Institutions like RISA, MINICT, Higher Learning Institutions, etc
  - Requirements: Diploma or Bachelor's in ICT or Computer Networks or related fields with knowledge in computer networking and certificates of Cisco - CCNA, CompTIA Network+, troubleshooting skills
  - Example: Rwanda Job lists positions like IT Support Officer and Network. Also Job Portal Kora often lists Network Administrator positions requiring proficiency in LAN/WAN systems and data security.
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## 2. Possible jobs cont'd

### Telecommunications Technician

- Sector/Subsector: Technical Services → Electronics and Telecommunication
  - Typical Employers: MTN Rwanda, Airtel, Broadband Systems Corporation (BSC), Rwanda Utilities Regulatory Authority (RURA)
  - Requirements: Advanced Diploma or Bachelor's in Telecommunication Engineering or Electronics; knowledge in RF systems, Fiber Optics, and basic Networking (CCNA preferred).
  - Example: MIFOTRA and LinkedIn Rwanda regularly advertise Telecommunication Technician and Field Network Engineer roles supporting national network infrastructure.
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## 2. Possible jobs cont'd

### **Fiber Optic Installation and Testing Specialist:**

- Employers are Telecom service providers, network contractors, ICT infrastructure companies. It requires Certification in Fiber Optic Network Installation, hands-on experience with OTDR testing, splicing, and termination; safety and documentation skills. LinkedIn Rwanda lists Fiber Technician roles for firms like Liquid Intelligent Technologies and KT Rwanda Networks.

### **Radio Frequency (RF) Engineer:**

- Employers are Telecom operators, satellite service providers, and ICT solution companies. Requires Degree in Electronics and Telecommunication Engineering, experience with spectrum analysis, RF design, and propagation modelling. Kora Job Portal occasionally advertises RF Engineer and Spectrum Management Specialist roles within national regulatory bodies.
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## 2. Possible jobs cont'd

### **Electronics Design and Manufacturing Technician:**

- Employers are Electronic equipment producers, TV/radio device assemblers, and IoT startups. Requires Diploma or Bachelor's in Electronics Design, PCB fabrication skills, and embedded systems programming (Arduino, Raspberry Pi).

### **Telecommunication Network Planner:**

- Employers: Telecom operators, infrastructure planning consultancies, and network rollout projects. Requires Bachelor's degree in Telecommunications, GIS skills, project management (PMP or PRINCE2), and understanding of LTE/5G architectures. LinkedIn Rwanda features Network Planner roles in ongoing 4G/5G expansion projects.
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## 2. Possible jobs cont'd

### **Broadcasting and Audio-Visual Engineer:**

- Employers are Rwanda Broadcasting Agency (RBA), production studios, and event companies. Requires Diploma or Bachelor's in Electronics, knowledge of audio-visual systems, digital signal processing, and live streaming setups.

### **IoT Systems Technician:**

- Employers: Smart agriculture, health tech, and logistics startups. Requires Diploma or degree in Electronics or ICT, knowledge of sensors, cloud integration, and wireless communication protocols (ZigBee, LoRa, MQTT). Job in Rwanda showcases IoT Field Technician positions in Kigali-based innovation hubs.

**Others:** TVET trainer, Communication Systems Integrator, Technical Project Coordinator, Electronics Quality Assurance Officer, Telecommunications Policy Analyst, Technical Sales Engineer, Electronics, Research & Innovation Technologist.

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# 3. Job positions

## Managerial / Supervisory Level (ISCO Major Group 1: Managers):

- Description: Positions involving planning, coordination, quality assurance, and supervision of operations or teams.
  - Tasks: Managing resources, enforcing safety/technical standards, coordinating projects.
  - Occupations may be: Technical Service Manager, Maintenance Supervisor, ICT Project Coordinator, Industrial Operations Manager.
  - Qualification Level: Bachelor's or Advanced Diploma (Level 6–7, RQF equivalent). ( Rwanda TVET Qualification Framework (RTQF), Workforce Development Authority (WDA), Workforce Development Authority, Kigali, 2020.) and (International Standard Classification of Occupations: ISCO-08, International Labour Organization (ILO), International Labour Office, Geneva, 2012.)
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# 3. Job positions cont'd

## Professional / Engineer Level (ISCO Major Group 2: Professionals):

- Description: Occupations requiring advanced technical knowledge, design, innovation, and system optimization.
  - Tasks: Designing systems, conducting research, developing and implementing standards.
  - Occupations may be: Electrical Engineer, Electronics Engineer, Network Design Engineer, Mechatronics Engineer, ICT Systems Analyst
  - Qualification Level: Bachelor's degree or higher (Level 6–8, RTQF). (World TVET Database – Rwanda, UNESCO-UNEVOC, UNESCO-UNEVOC, 2018.) and (National TVET Program Catalogue and Occupational Standards, Rwanda Polytechnic, Rwanda Polytechnic, 2022.)
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### 3. Job positions cont'd

#### **Technician / Technologist Level (ISCO Major Group 3: Technicians and Associate Professionals):**

- Description: Hands-on implementation and support of technical systems under engineer or manager supervision.
  - Tasks: Testing, installing, configuring, troubleshooting, and maintaining equipment or systems.
  - Occupations may be: Network Technician, Industrial Electrician, Instrumentation Technician, ICT Support Technician, Telecommunications Technician
  - Qualification Level: Diploma or Advanced Certificate (Level 4–6, RTQF). (Competence-Based Training Implementation Manual, Rwanda Polytechnic – IPRC Kigali, Rwanda Polytechnic – IPRC Kigali, 2023.) and (National Occupational Standards (NOS) for Electrical and ICT Sectors, Workforce Development Authority (WDA), Workforce Development Authority, 2019.)
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## 4. Summary

- The subsector of ETT grows from L3 to L5 with a qualification of Advanced Technical Certificate.
  - L6 to L7 provide qualification of Diploma and Advanced Diploma while L8 provide Bachelor of technology. Advancing to a master's degree allows for specialization in areas related to the career, yet to come.
  - Professionals can start in entry-level roles such as Telecommunications Engineer or Network Planning Engineer, then progress to mid-level positions like R&D or Hardware Engineer. With experience, they may advance to senior roles such as Project or Program Manager.
  - Career growth is fuelled by specialization in emerging technologies like 5G and IoT, continuous learning through certifications and advanced degrees, and strong industry demand from high tech companies.
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  - Graduates' and Schools' Managers' Perceptions of the Role of Industrial-Based Training in Technical Vocational Education and Training, Rwanda., Michael Rwibasira Tusiime; Irénée Ndayambaje; Kizito Ndiokubwayo, African Journal of Governance and Development, Vol. 11, Issue 1.2, 2022, pg. 351-366.
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