

Occupation and Learning Process

WEEK 11 - Adapting to the Future of Work

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Objectives

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

1. Understand trends for future of work like digitalization, automation and green jobs.
 2. Understand the employability strategies and lifelong learning plans for a digital and sustainable.
 3. Adapt to the employability strategies and lifelong learning plans for a digital and sustainable.
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1. Introduction to the future of work

- The future of work is rapidly evolving, shaped by digitalization, automation and the growth of green jobs. These trends are redefining occupational structures, skill requirements, and lifelong learning needs worldwide.
 - **Digital transformation** integrates digital technologies across all sectors, revolutionizing how goods and services are produced and delivered.
 - **Automation** uses machines and algorithms to perform tasks once done by humans, particularly in manufacturing, logistics, and customer service.
 - **Green jobs** support environmental sustainability through areas such as renewable energy, waste management and eco-friendly construction. (The Future of Jobs Report 2025, World Economic Forum, World Economic Forum (WEF), 2025.)
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1. Introduction to the future of work cont'd

- It is noticed that more than 60% of employers finds digitalization and automation reshaping operations by 2030 with urgent need to realign occupational training and skills development with future workforce demands.
 - **Occupation:** Digital tools are redefining roles in ICT, finance, education and healthcare and Automation is replacing repetitive tasks creating new jobs in robotics, AI and data analytics.
 - **Learning:** Competency-based training (CBT) is gaining traction, emphasizing practical skills over theoretical knowledge and E-learning platforms and virtual labs are becoming essential for technical and vocational education.
 - Rwanda Polytechnic adopted CBT to align with industry needs and learners are equipped for emerging roles in digital and automated environments.
(Competence-Based Training Implementation Manual, Rwanda Polytechnic – IPRC Kigali, Rwanda Polytechnic – IPRC Kigali, 2023.)
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1. Introduction to the future of work cont'd

- Green jobs are central to sustainable development and climate resilience. They span sectors such as: Renewable energy (solar technicians, hydropower engineers), Sustainable agriculture (agroecology specialists), Waste management and recycling.
 - Green transitions can generate large-scale employment, especially for youth and medium-skilled workers.
 - In Rwanda, initiatives like the Green Growth and Climate Resilience Strategy support green job creation in areas like solar installation and eco-construction. (Navigating the Future: Skills and Jobs in the Green and Digital Transitions, International Labour Organization, ILO Publications, 2024.)
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1. 1. The context of Rwanda

- Rwanda added 358,000 new jobs in 2024, with the largest contributions from agriculture, ICT and construction. This reflects a continued structural shift from subsistence farming to more productive sectors, driven by public investment, digital transformation, and infrastructure expansion. (Top 10 Sectors That Contributed to 2024 Job Creation in Rwanda, Africa-Press Editorial Team, Africa-Press, 2025.)
 - The Rwanda TVET Qualification Framework (RTQF) provides a national benchmark for aligning vocational training with labour market needs. It defines occupational standards, competency levels, and pathways for upskilling, ensuring that technical education remains responsive to sectoral demands. (Rwanda TVET Qualification Framework (RTQF), Workforce Development Authority (WDA), Workforce Development Authority, Kigali, 2020.)
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1. 2. Examples of Technical Services

- **Digital Innovation:** At FabLab Rwanda, young technicians trained in mobile app development are building real-world solutions in e-health, fintech and agritech. These include mobile diagnostic tools, digital payment platforms and farmer advisory apps demonstrating how digital skills translate into entrepreneurship and service delivery. (2024 in Review: Top Tech Milestones in Rwanda, WebRwanda Editorial Team, WebRwanda, 2024.)
 - **Automation for Smart Agriculture:** Students from Rwanda Polytechnic have designed and deployed various automated systems using microcontrollers and sensors. Irrigation system helps optimize water use in agriculture, supporting climate resilience and productivity in rural areas. (Technological Trends to Watch in Rwanda in 2024, Francis Siaka, FOSIA Agency, 2024.)
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1. 2. Examples of Technical Services cont'd

- **Green Jobs and Renewable Energy:** Through training supported by the Rwanda Green Fund (FONERWA), solar technicians are installing off-grid solar systems in underserved communities. This not only expands energy access but also creates sustainable employment in the growing green economy. (Technological Trends to Watch in Rwanda in 2024, Francis Siaka, FOSIA Agency, 2024.)
 - **Smart Classrooms with Interactive Boards:** Rwanda's Ministry of Education expanded its smart classroom initiative in 2024, equipping schools with interactive whiteboards, tablets and digital content delivery systems. These setups rely on embedded electronics, wireless connectivity and audiovisual integration to enhance STEM learning. (How Tech Innovation Has Eased Everyday Life in Rwanda, SENS Magazine Editorial Team, SENS Magazine, 2025.)
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1. 3. Summary for future work trends

- The future of work is being shaped by digitalization, automation and sustainability.
 - Digitalization integrates technology into all aspects of work enabling remote collaboration and data-driven decision-making.
 - Automation replaces repetitive tasks with AI and robotics increasing efficiency but also changing required skill sets.
 - Green jobs focus on environmentally sustainable industries and practices, driving employment growth in renewable energy, waste management and climate solutions.
 - Together, these trends demand new digital, technical and environmental skills for the workforce.
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2. Trends

- The need to examine how digitalization, automation, and green job transitions have influenced employment patterns over the past three decades and how these trends are expected to evolve in Rwanda and beyond over the next two decades are keys to plan how to cope with the changes and get ready for contribute.
 - It is better to identify key skills and competencies needed to thrive in a technology-driven and sustainable job market and propose individual action plans for continuous professional development using online learning, certifications and digital literacy tools as strategies to cope with the changes.
 - The use of online platforms such as Irembo, Job in Rwanda and LinkedIn to explore job opportunities, create professional profiles and apply AI-supported job matching techniques that align with Rwanda's Vision 2050 and NST2 priorities.
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2. Trends cont'd

- Between 1995 and 2005, the global labour market transformed due to the rise of internet and ICT adoption. Businesses embraced digital systems for communication, data management, and operations.
 - This shift catalysed the growth of Business Process Outsourcing (BPO) and call centres. New service jobs emphasized English fluency, computer literacy and process skills.
 - Demand for ICT training and infrastructure surged, especially in developing economies. (Information and Communication Technologies and Development: A Global Perspective, World Bank, World Bank Publications, 2003.)
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2. Trends cont'd

- Following the 1994 genocide, Rwanda prioritized ICT as a pillar of national recovery and modernization. The NICI I Plan (2000–2005) promoted digital literacy and ICT-enabled governance. Computer education and internet access expanded in schools and public institutions.
 - Telecom firms like Rwandatel and MTN Rwanda introduced digital services and infrastructure. This created new technical roles in electronics and telecommunications, laying the groundwork for a digital workforce.
 - The ICT rollout enabled infrastructure and telecom liberalization, laid the groundwork for digital transformation. By 2001, RITA's creation and emerging technical roles in cabling and network setup enabled call centres and public ICT units. (National Information and Communication Infrastructure (NICI I) Policy and Plan 2000–2005, Ministry of Infrastructure (formerly MINICT), Government of Rwanda, 2001.)
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2. Trends cont'd

- 2005–2015 demonstrated the era of Mobile services and informal digital work such as Mobile telephony, mobile money and early platform work expanded informal and formal service opportunities especially in African cities.
 - Between 2005 and 2015, mobile telephony and mobile money reshaped digital inclusion and informal work across Africa. Rwanda's NICI II and III Plans expanded ICT access, e-government services and digital education.
Mobile money platforms like MTN Mobile Money and Tigo Cash empowered microenterprises and digital trade.
 - Technical services grew in mobile maintenance, SIM registration, and telecom infrastructure, supported by Technical Colleges' graduates. Agriculture, health and education adopted mobile-based solutions, advancing Rwanda's Vision 2020 goals.
(ICT Sector Strategic Plan 2010–2015: NICI II and III Implementation Review, Ministry of ICT (MINICT), Republic of Rwanda, Government of Rwanda, 2010.)
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2. Trends cont'd

- Technical services impact: Electronics and telecom technicians became vital in maintaining mobile towers, configuring base stations and repairing handsets.
 - Cross-sectoral benefits: Agriculture benefited from mobile advisory services; health centres used SMS for patient reminders and education platforms began experimenting with mobile learning. The informal sector saw digital micro-entrepreneurship rise especially among youth.
 - This has dictated a competitiveness in this changing landscape; job seekers must adopt proactive strategies that align their skills with evolving market trends.
 - For example; digital literacy has become no longer optional but a fundamental skill for all job seekers.
 - Similarly, effective job matching had to play a very important key role in bridging the gap between available talent and job opportunities.
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2. Trends cont'd

- From 2015 to 2025, cloud computing, data analytics and early AI tools reshaped global digital work. Governments invested in e-ID, e-tax and digital health systems, creating new ICT-based employment.
 - Institutions, government and non-government agencies started investing in technical skills to attract most competent graduate as well as mind ready for innovation and technical solutions.
 - Rwanda advanced its digital agenda through the Smart Rwanda Master Plan and ICT Sector Strategic Plan.
 - Fiber backbone expansion and 4G rollout enabled widespread connectivity and service innovation.
 - Thousands were trained in coding, data science and entrepreneurship via FabLab, CMU Africa and national programs.
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2. Trends cont'd

- Electronics technicians now manage smart devices, IoT sensors and solar-powered telecom systems.
 - Telecom engineers support 4G/5G networks and cloud-based infrastructure for public services.
 - Sectors like health, education, finance, and environment benefit from ICT-enabled platforms and green technologies. (ICT Sector Strategic Plan 2018–2024: Towards a Digital Enabled Economy, Ministry of ICT and Innovation, Republic of Rwanda, Government of Rwanda, 2018.)
 - Over the past 30 years, Rwanda's labour market has shifted from basic ICT roles to advanced technical services. National policies have nurtured a digital ecosystem rooted in electronics and telecommunications.
 - Digital jobs now span software, data, telecom and device maintenance across public and private sectors.
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2. Trends cont'd

- Cross-sectoral innovation has emerged in health, education, finance and agriculture.
- Technical services remain central to inclusive growth and knowledge economy development.
- Future priorities include green-tech, AI integration and regional ICT leadership.

This evolution positions Rwanda as a model for digital transformation in Africa.

(Vision 2020 and Beyond: Rwanda's Digital Transformation Journey, Ministry of ICT and Innovation, Republic of Rwanda, Government of Rwanda, 2025.)

- Rwanda transformed from rebuilding its ICT infrastructure to emerging as a regional digital leader, driven by advances in adopting trending technologies, the nation pursues Vision 2050, strengthening digital skills, innovation and sustainable employment to thrive in the evolving global digital economy.
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3. Strategies for employment

- The future of work is evolving rapidly as digitalization, automation and sustainability redefine industries and professional landscapes.
 - In Rwanda and globally, this transformation is shifting occupational structures and altering the skills demanded by employers.
 - Digital technologies are now integrated into almost every sector from finance and education to manufacturing and health, requiring workers to be adaptable and technologically literate.
 - Automation, through robotics and artificial intelligence, continues to replace repetitive tasks, prompting the need for reskilling and upskilling.
 - Additionally, the emergence of green jobs reflects a growing emphasis on environmental sustainability, creating new employment opportunities in renewable energy, waste management and eco-friendly construction.
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3. Strategies for employment cont'd

- Proactive strategies aligning skills with evolving market trends is very key; continuous learning and professional development are essential through online learning platforms, vocational training and digital certification programs to gain relevant competencies.
 - Digital literacy is no longer optional but a fundamental skill for all job seekers since the knowledge of data analysis, cloud computing, cybersecurity and AI applications can significantly enhance employability.
 - Soft skills such as communication, teamwork, adaptability and critical thinking qualities have shown much of a need across sectors.
 - The foundation program is a very good strategy adopted by Rwanda Polytechnic to enhance soft skills and communication skills among other skills provided in the program to prepare students into pro-active graduates ready to employment.
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3. Strategies for employment cont'd

- Rwanda's government has made significant progress aligning its national vision with digital and green transitions through Vision 2050 and the National Strategy for Transformation (NST2). Ministries such as Finance and ICT are prioritizing investments that connect policy frameworks with skills development and sustainability goals.
 - For instance, Rwanda Polytechnic (RP) contributes to this national agenda by reforming its curricula to align with emerging technologies and environmental sustainability, ensuring that training in ICT, electronics and renewable energy supports the country's transition toward a green, knowledge-based economy. (Vision 2050: National Long-Term Development Perspective for Rwanda, Ministry of Finance and Economic Planning, Republic of Rwanda, Government of Rwanda, 2020.)
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3. Strategies for employment cont'd

- Expanding affordable digital access and green investment remains a top national priority. For example, Rwanda's ICT Sector Strategic Plan emphasizes broadband expansion, digital community centres and partnerships that bridge urban-rural divides and strength strong connected people.
 - RP supports applied projects in partnerships with local districts to give students and communities practical access to green and digital technologies to remain key players in national employability, connectivity and sustainability efforts.
 - The open calls for youth, females and people with disabilities has been a trending strategy that shown a promising future.
 - The open to the call, social media access to recent jobs showing the required skills as well as the recommendations for professional development remains a motivating strategic factor for future of work.
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3. Strategies for employment cont'd

- A very important strategy; Rwanda's integrated approach linking education, industry and policy positions it to lead in Africa's digital and green economy. RP plays a key role by ensuring inclusivity in its training programs, targeting youth, women and rural learners through outreach initiatives and practical training centres.
 - Moving toward Vision 2050, coordinated investment in connectivity, TVET modernization and equitable access to digital skills will be essential for Rwanda to transform future-of-work challenges into engines of sustainable and inclusive growth. (Rwanda Polytechnic Strategic Plan 2019–2024, Rwanda Polytechnic, Ministry of Education, Republic of Rwanda, 2019.)
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3. 1. The Government

- National strategy and budgets with digital and green transitions for digital skills and green economy targets across Vision 2050 and NST2 implementation and fund TVET and higher-education reforms that match market signals.
 - The main emphasis is to set Rwanda's high-level direction for becoming a high-income, knowledge-based and green economy by 2050 by integration of digital skills, sustainability and human capital development and guides NST2 implementation and education reforms aligned with market needs.
 - Invest in connectivity and affordable digital access. Prioritise last-mile broadband, community digital centres and public-private partnerships to reduce digital divides and enable platform participation.
 - The ICT prioritises connectivity with last-mile broadband, digital inclusion and public-private partnerships for community digital centres and platform access, aligning with national goals for equitable digital transformation.
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3. 2. The Industry

- Invest in on-the-job digital/AI literacy. Firms should upskill current staff in digital tools, data literacy and supervisory AI skills instead of only hiring externally.
 - Partner with TVET, universities and innovation hubs. Co-design short courses, internships and applied R&D programs so graduates have practical skills for Rwanda's ICT, logistics and green sectors (link local HANGA hubs and national innovation programs).
 - Adopt responsible automation pathways. When automating, create redeployment or retraining plans; favour technology that augments rather than fully replaces workers where viable.
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3. 3. Academia and job seekers

- Prioritise foundational digital skills with domain know-how. Basic digital literacy, data handling and cybersecurity basics must be taken essential across sectors, they should be paired with sectoral expertise, mostly national high priorities.
 - Embrace modular learning and micro-credentials. Short, stackable courses (TVET modules, online certifications) let workers update skills quickly as technologies change.
 - Strengthen soft and higher-order skills. Creativity, problem solving, adaptability, supervisory and interpersonal skills are harder to automate and increasingly valued.
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