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Challenges faced by VET providers in integrating circular skills into training programs

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What Are Circular Skills?

- Skills that support sustainability, resource efficiency, and waste reduction.
- Enable systems thinking and closed-loop processes.
- Skills include repair, reuse, remanufacturing, eco-design, and lifecycle thinking.
- Relevant across all sectors e.g. agriculture, logistics, ICT, manufacturing, and services.
- Circular skills should combine technical expertise with adaptability and innovation.
- Promote a mindset shift from linear to regenerative economic models.
- Encourage collaborative problem-solving and cross-sector thinking.
- Essential for implementing circular business models and green technologies.

Importance of VET in Circular Economy

- Vocational Education and Training (VET) is essential in advancing the circular economy, as it provides practical, employment-focused education tailored to the needs of emerging green jobs. VET equips learners with hands-on skills and competencies required in circular industries such as recycling, repair, renewable energy, sustainable manufacturing, and waste management.
- By focusing on real-world applications and workplace readiness, VET helps bridge the skills gap in sustainability sectors, ensuring a workforce capable of supporting resource efficiency and low-carbon solutions. It trains workers not only to perform tasks competently but also to adapt to diverse, evolving work environments where planning, execution, and sustainable practices intersect.
- In short, VET is a vital driver in building a skilled labour force that can meet the demands of the green transition and foster long-term, inclusive growth in a circular economy.

Challenges in Integrating Circular Skills into VET Programs

Challenge 1 – Curriculum Misalignment

- Many existing curricula are outdated and do not reflect current circular economy principles.
- Circular skills are often scattered across unrelated subjects, lacking a cohesive learning pathway.
- There is a pressing need for modernized, interdisciplinary course designs that integrate sustainability, systems thinking, and lifecycle analysis.
- Curricula should be designed with consideration for the varied backgrounds and experiences of participants.
- The curricula should be carefully designed to address sector-specific requirements.

Challenges in Integrating Circular Skills into VET Programs

Challenge 2 – Trainer Capability

- Many instructors lack knowledge and experiences of circular economy, making it challenging to effectively teach relevant skills, despite the academic experience and background.
- Access to upskilling opportunities in green technologies remains limited, hindering trainers' ability to stay current with industry trends.
- Targeted training in circular economy tools is essential to enable educators to provide high-quality, future-oriented instruction tailored to the needs of multidisciplinary learners and sectors.

Challenges in Integrating Circular Skills into VET Programs

Challenge 3 – Limited Industry Integration

- One of the major barriers to effectively embedding circular economy skills in Vocational Education and Training (VET) is the weak collaboration between **training providers and circular economy businesses.** Strong partnerships with industry are essential to ensure that training programs are aligned with current and future workforce needs, especially in rapidly evolving green sectors.
- Currently, many VET programs suffer from a mismatch between job market requirements and the skills taught. Employers in circular industries—such as sustainable manufacturing, resource recovery, and renewable energy—often struggle to find graduates with relevant, job-ready skills. This disconnect stems from insufficient input from industry stakeholders during curriculum development and a lack of real-time labour market data informing training content.
- Moreover, there is significant underutilization of applied learning opportunities and innovation centres. Facilities like living labs, maker spaces, and green tech hubs are ideal platforms for practical training and experimentation with sustainable technologies. However, many VET institutions lack access to these environments or do not fully integrate them into learning pathways. As a result, learners miss out on hands-on experience with real-world circular systems and technologies.
- To overcome this challenge, VET providers need to strengthen ties with circular economy businesses through collaborative curriculum design, industry placements, co-delivery of courses, and shared use of innovation infrastructure. This would not only improve the relevance of training programs but also enhance learners' employability and readiness for green careers.

Challenge 4 – Systemic and Policy Barriers

- A significant obstacle to integrating circular economy skills into VET programs lies in systemic and policy-level barriers. Many vocational education systems respond too slowly to the evolving demands of the green transition. This lag hinders the timely development and implementation of relevant training programs that align with circular economy principles.
- One major issue is the lack of national alignment and strategic foresight. Without a unified vision or coordinated policies across sectors and regions, efforts to integrate sustainability into vocational education remain fragmented and inconsistent. As a result, initiatives often fail to scale or sustain impact beyond isolated pilot projects.
- Additionally, there is often insufficient policy support and funding for curriculum reform, educator training, and industry collaboration. This lack of investment limits the ability of institutions to update their programs or invest in innovation, tools, and partnerships that support circular skill development.
- To overcome these barriers, strong political will, cross-sector collaboration, and long-term planning are essential. Policy frameworks must prioritize green skills development, ensure alignment with national circular economy strategies, and provide the resources and incentives needed to drive systemic change within the VET landscape.

Key Recommendations

- Develop interdisciplinary and circular-aligned curricula.
  - Redesign curricula to be interdisciplinary, connecting environmental science, design, engineering, and business.
  - Integrate core circular economy concepts such as resource efficiency, lifecycle thinking, product reuse, and sustainable innovation.
- Embed real-world case studies and problem-solving projects to strengthen understanding and application.
- Upskill VET staff and create digital learning formats.
- Foster industry partnerships and policy alignment.
- Invest in VET infrastructure supporting practical circular skills.
- Upgrade training centres with green technology equipment, repair labs, and materials reuse facilities.
  - Support the development of innovation hubs and applied learning spaces focused on circular practices.
  - Ensure equitable access to such infrastructure across urban and rural regions.

Conclusion

- VET is essential to advancing a sustainable and circular economy.
- Circular mindsets and skills must be directly addressed in the classroom, which requires investment in appropriate resources such as training equipment, teacher upskilling, and access to educational materials and resource libraries.
- The challenges are multi-layered, and significant effort is still needed to fully mainstream circular economy principles within VET systems.
- Circular economy should be integrated as a mandatory cross-cutting theme within vocational education and training qualification frameworks, including in-company training.
- Multiple barriers currently hinder the full integration of circular skills, including gaps in curriculum design, trainer capability, and industry alignment.
- Collaboration, innovation, and sustained investment are key drivers for embedding circular economy practices effectively into vocational education and training.

Thank you

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