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International Centre for Technical and Vocational Education and Training

Closing the Institutional Gap for the Circular Economy in TVET:

Trends and perspective from three countries in Africa

Draft synthesis report

Education 2030

Summary

The global workforce needs to adopt greener and more sustainable practices to eliminate social shortfalls and avoid deepening ecological crises. Transitioning to a circular economic model is one of the approaches that has gained traction as a viable long-term solution. There is a consensus that technical and vocational education and training (TVET) systems will play a crucial role in the circular transition, mainly by equipping and upskilling professionals in relevant sectors such as waste management, construction, agriculture and manufacturing. However, many TVET institutions face obstacles that limit their ability to integrate these green and circular skills.

To support TVET institutions in the development and implementation of green and circular strategies to transform their learning and training environments, UNESCO-UNEVOC, in collaboration with Circle Economy, conducted a short study aimed at analysing the situation, barriers and enablers to the effective implementation of circular approaches in teaching and learning in TVET institutions in three countries. The goal is to establish a clear picture that can inform the global discourse towards enhancing TVET's role in developing the needed skills and competencies to help accelerate the adoption of circular approaches in business, enterprises and other economic activities supporting the green transition.

The study is focused on three countries—Ghana, Kenya and South Africa—which involved a sample size of 27 different actors, relevant bodies and institutions of TVET that helped establish an estimation of the current status quo and areas of future action.

Box 1: What is the circular economy?

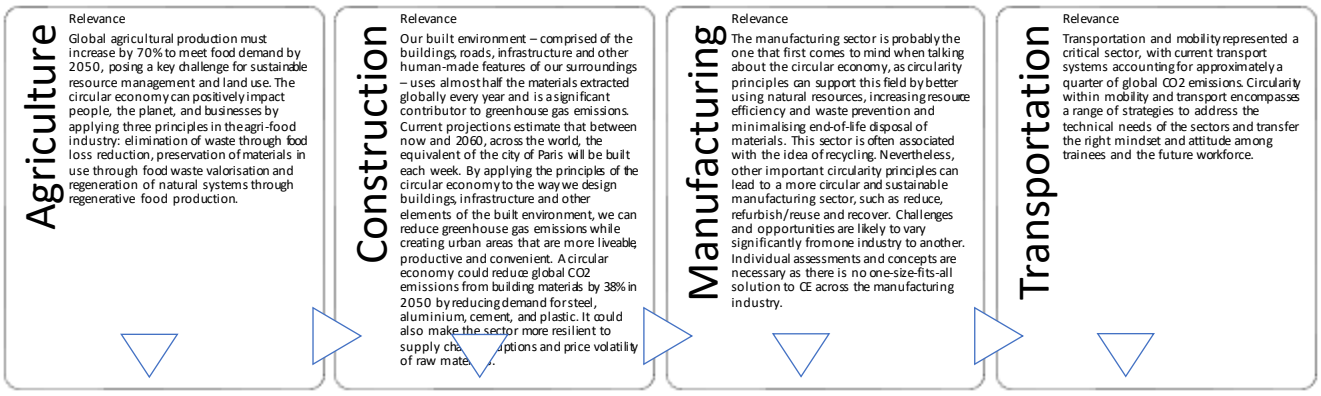
The circular economy is a model of production and consumption that aims to minimize waste and promote sustainable use of natural resources through smarter product design, longer use, recycling and more, as well as regenerate nature. Fundamental principles of the circular economy concern designing out waste, regenerating ecosystems and keeping items in use.

The circular economy departs from the traditional, linear economic model based on a take-make-consume-throw-away pattern.

Besides helping to tackle the problem of pollution, a circular economy can play a critical role in solving other complex challenges, such as climate change and biodiversity loss.

The circular economy is applicable across all sectors and industries; however, the concept may be particularly salient for fields identified as central to the green transition: energy; environmental goods and services (including water and waste management); construction; manufacturing; agriculture and forestry; transportation; tourism and extractive industries. The study shows these fields are most relevant to the three analysed countries.

Sectors relevant to a circular transition



Role of TVET			
TVET can promote adaptability and related transversal skills, fostering a culture of openness to adopting new technologies and organic farming techniques (such as precision farming, micro-irrigation, and vertical farming). TVET must also update curricula to include the technical proficiency required for crop diversification. By doing so, TVET will equip farmers to find ways of producing more food that is more profitable while also having a less detrimental impact on the natural environment.	TVET can introduce students to new approaches to creating resource-efficient growth. Circularity in this sector is particularly useful for dealing responsibly with construction and demolition waste (C&DW). Landfilling is still the most common disposal method for this waste category, which comprises approximately one-third of the world's overall waste generation and at least 40% of carbon emissions. There is significant potential for circular economy strategies regarding recycling and closed-loop circulation of resources, which would also capture higher economic value from C&DW.	TVET institutions can teach their students about reducing dependency on raw material supplies, thereby increasing resilience and sustainability. TVET can also promote circularity by teaching eco-design skills and on-demand production. Circular skills are complementary: eco-design would be complemented by extending the lifetime of manufacturing equipment, which can be fostered by re-framing engineering, maintenance and repair skills. Recycling of post-industrial waste also plays a key role; there are commercially available technologies for post-industrial cotton recycling, which could be highlighted and explored through TVET curricula.	TVET must integrate new 'deep' technical skills in electric vehicle manufacturing and maintenance. Equally important will be the transversal personal-reflective skills that encourage lifestyle changes that embrace public transport use and reduced air travel.

Overview of the results

Based on the results gathered, the following reflections were drawn.

- While TVET providers (universities, research or training centres) consider the circular economy to be important to their country's labour market and TVET training provisions (4.44 and 4.11, respectively[1]), their current understanding and knowledge around the topic is comparatively low (Figure 1).

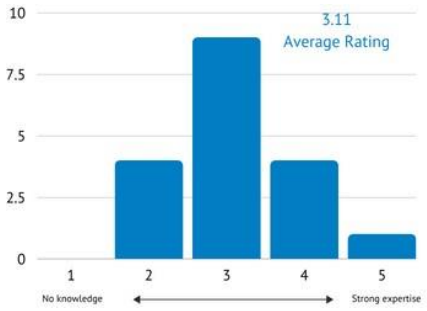


Figure 1: Perceived level of knowledge and understanding of the circular economy, TVET institutions' perspective.

- There is a disconnect between the current perception of the impact of a circular economy on the labour market and the action being undertaken to integrate circularity within curricula Figure 2).

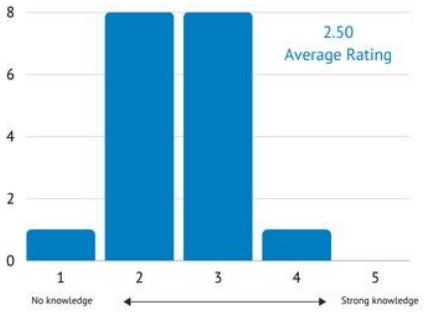


Figure 2: Perceived level of integration of circular economy principles in teaching and learning, TVET providers' perspective.

- Despite their acknowledgement of the importance of circular economy topics within curricula (3.78) and the even more important role it will play in the future (4.22), over half of TVET authorities (ministries or national bodies) recognize that current TVET regulating measures or guidance frameworks do not adequately support TVET providers to adopt practices in the delivery and design of curricula that can actively reflect learning about circular economy principles, meaning that the circular economy is still emerging as a new priority within the political environment in which many TVET authorities operate (Figure 3).

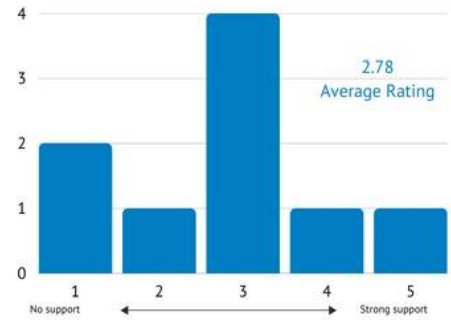


Figure 3: TVET authorities' level of support for the integration of circular ideas and practices in TVET curricula.

Key takeaways

[1] For the purpose of the study, the majority of the questions used a ranking from scale 1 (no impact/knowledge) to 5 (strong impact/knowledge)

Overall, the study's results highlight the need for closing the institutional gap by building the capacity of both TVET institutions and stakeholders within the enabling environment in which they operate. Specifically, industry and national governments can play a role in embedding skills and competencies for the circular economy in TVET curricula.

Four factors emerged as those that play a crucial role in driving the integration of skills and competencies for the circular economy in TVET, namely:

1) Policy and Regulatory Frameworks;

2) Industry engagement and Partnerships;

3) Curriculum development and updates;

4) Financing and investment.

Nevertheless, it is impossible to make a clear distinction between enablers and barriers. All the aforementioned elements can assume both roles, mainly depending on the attitude of the regulatory and governing bodies. Thus, the same key factor can be either enabling or barring depending on the context in which it is applied, which can, in turn, ultimately support or undermine the capacity of the TVET system to respond to the needs of the growing circular economy. This insight demonstrates the role that TVET stakeholders and institutions can play in shifting factors from being limiting to enabling the uptake of circular skills.

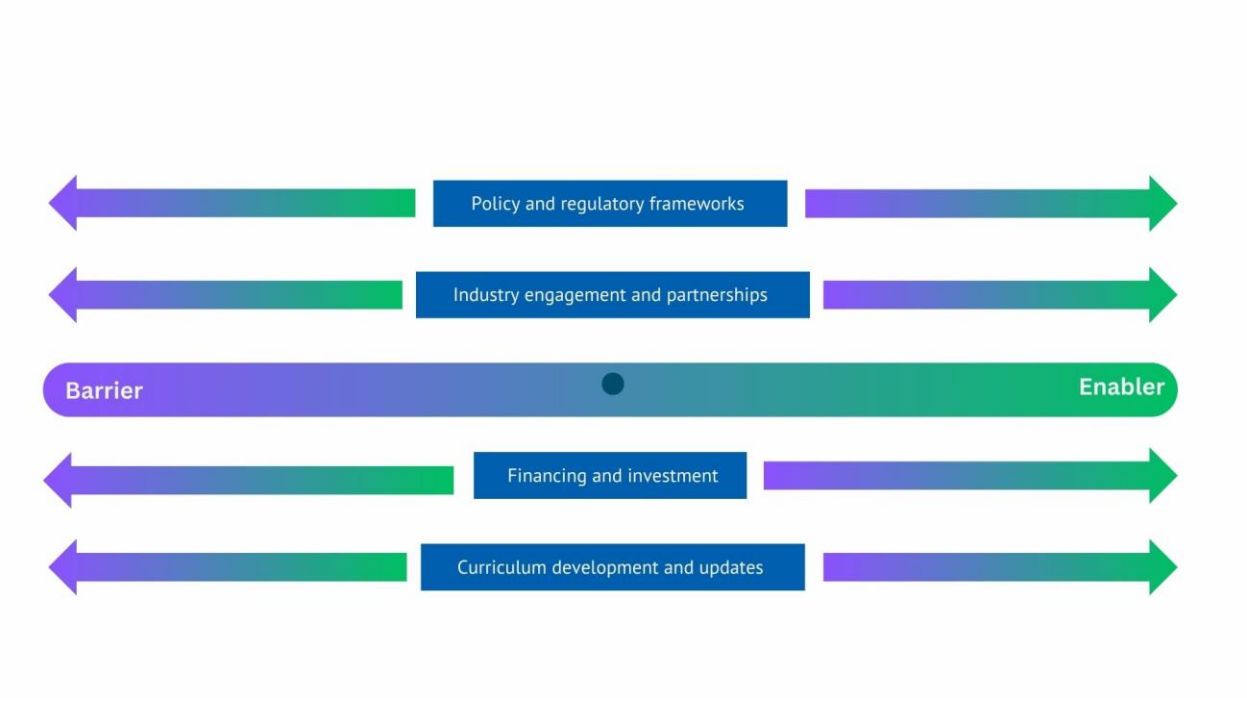


Figure 4: Key factors to the integration of the circular economy in TVET

Recommendations

Based on the findings, TVET institutions are aware of the importance of skills for the circular economy within the context of their labour markets but lack the awareness and knowledge of what and how these skills need to be integrated, along with access to best-case practices within specific sectors. At the same time, the enabling environment and the foci of the TVET policy agenda often do not include circular economy learning. Thus, developing the capacity of TVET institutions to incorporate circular economy learning is a crucial requirement for national and international institutions interested in advancing the circular economy agenda with and for people.

TVET authorities, training providers and stakeholders within the enabling environment surrounding TVET institutions may consider the following recommendations:

1. **Restructure governance, policy and regulatory mechanisms and widen stakeholders' engagement in TVET**

- Supportive governance, policy, and regulatory arrangements are some of the critical factors influencing TVET's ability to integrate skills for the circular economy into their curricula. As evidenced by the study, bureaucratic governing structures within TVET can often delay the updating of curricula, which undermines the ability of TVET to respond to labour market needs.

- The lack of separation of TVET regulation and provision can often make it more challenging to ensure accountability. Hence, TVET authorities must set up appropriate governance and policy frameworks at national, regional, sectoral and local levels to ensure effective coordination among these stakeholders and alignment with national priorities.
- Coherent cooperation mechanisms and coordination arrangements can drastically reduce the turnaround time to approve changes within TVET curricula—increasing the responsiveness of TVET. TVET authorities can set up appropriate regulatory mechanisms to involve industry stakeholders in shaping TVET, such as including industry representatives on TVET boards, co-designing programmes with industry stakeholders and establishing apprenticeships and work-based learning programmes. In addition, TVET authorities, in collaboration with providers, can explore arrangements to decentralize decision-making power to support TVET providers in being more responsive to the shifts in employment and skill profiles necessary for the circular transition.
- There must be a balance between flexibility and accountability to ensure that TVET providers are responsive while upholding relevant standards. TVET authorities can set up accountability mechanisms by developing relevant performance indicators. Such accountability mechanisms should measure both administrative factors and graduates' labour market outcomes. The latter is significant as most TVET systems that use performance indicators focus on the former[2].

2. **Support TVET institutions with resources and tools to integrate skills and competencies for the circular economy within TVET curricula**

- TVET providers need to have access to information regarding the current and future profile of jobs and skills within critical sectors impacted by the circular transition in the countries and regions in which they operate. This will influence the knowledge, skills and competencies embedded within TVET curricula and consequently prepare graduates for work in the circular economy.
- Some key sectors relevant to the circular transition are renewable energy, environmental goods and services, construction, manufacturing, agriculture, transportation, tourism and extractive industries. Industry stakeholders and TVET providers must collaborate closely to align and share their insights on occupational and skill profiles relevant to the circular economy, considering the dynamic influence of local, global and regional trends.
- There is a need to foster and expand work-based training and apprenticeships for emerging and priority sectors to promote skills development for the circular economy within TVET.
- TVET institutions, industry stakeholders and educational institutions must work together to create toolkits that provide 'how-to' guidance on designing competency standards and curricula for circular jobs, adapting curricula, training delivery and assessments.

[2] UNESCO. (2021). *Learn for Our Planet: A Global Review of How Environmental Issues Are Integrated in Education.* Retrieved from: UNESCO's Website

3. **Revisit TVET funding and enhance efficiency**

- TVET authorities and industry stakeholders need to work together to identify a diverse range of funding mechanisms for TVET providers by exploring how both public and private investments in TVET can be encouraged and utilized.
- Public financing can support equitable access to TVET, increasing enrolment in critical fields, promoting social inclusion and strengthening the development of key transversal and specialized skills within TVET curricula. Private funding can encourage workplace apprenticeship development and include additional resources in TVET (such as equipment and relevant infrastructure).

4. **Tackle social exclusion and nurture a gender-responsive approach to TVET**

- The Sustainable Development Goals (SDGs) outline skills development through TVET as a pathway for decent work. TVET can promote sustainable development by supporting decent work and lifelong learning, contributing to inclusive and sustainable economic growth and competitiveness, social equity and environmental sustainability.
- TVET authorities, in collaboration with TVET providers, need to develop active measures to ensure inclusion and promote the participation of women while addressing the structural barriers they face. This includes developing gender-specific business development programmes and encouraging the participation of female students in Science, Technology, Engineering and Mathematics (STEM). In addition, the measures need to address social norms and perceptions as well as barriers such as access to finance, technology and gender segregation in labour markets that can further boost women's participation in TVET.

The capacity of TVET systems to contribute towards sustainable and inclusive development is based on their ability to provide access, equity, quality, and relevance in curricula and training. This relies on collaboration and engagement with stakeholders, including TVET institutions, government and industry stakeholders. The capacity also relies on solid foundations in policy and regulatory frameworks, governance and funding mechanisms. Successful reforms will adopt targeted mechanisms while recognizing the interdependence between these factors.

In conclusion, three key reflections can be drawn.

The main findings are that the challenges are multi-layered, and there is still a long road ahead to mainstream circularity in TVET.

While TVET providers (universities, research or training centres) recognize the importance of circularity and its impact on labour markets, they are constrained by their capacity to integrate circular skills within TVET curricula effectively. Furthermore, despite their acknowledgement of the importance of circular economy topics within curricula, over half of TVET authorities (ministries or national bodies) recognize that they are not adequately supporting TVET providers. This highlights the need to build the capacities of TVET providers and TVET authorities to embed circular skills and competencies within TVET effectively.

Alongside recognizing the key circular skills that need to be embedded in TVET, it is necessary to focus on developing the enabling environment surrounding TVET and, with this, the capacity of TVET institutions. Addressing current gaps and promoting the development of a supportive enabling environment is key to realizing the full benefits of the circular transition, including job creation and sustainable and inclusive development.

The study's findings are based on the results of a questionnaire completed by 27 respondents from across 17 institutions from the three countries of focus (Ghana, Kenya and South Africa) and triangulated with relevant literature. Hence, the

results are not necessarily generalizable beyond the country contexts and the specific institutions but aim to provide useful learnings for the international TVET community.

The report is being finalized and will be published by UNESCO-UNEVOC towards the end of 2023. Please visit unevoc.unesco.org

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Closing the institutional gap for the circular economy in TVET: Trends and perspective from three countries in Africa

Draft synthesis report

This report presents the results of research by UNESCO-UNEVOC on institutional gaps that limit TVET institutions' ability to contribute to the green transition effectively. The research focused on the enablers and barriers to effective implementation of circular approaches. This preliminary assessment was conducted in three sub-Saharan African countries: Ghana, Kenya, and South Africa.

The study's findings – in terms of data, policy trends and the role of different actors – offer guidance to governments and TVET institutions that wish to improve teachers' and trainers' acquisition of circular skills, as well as their capacity and propensity to apply tools, services, and technologies to deliver quality, learner-centred education and training for the circular economy.

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Sustainable Development Goals