European Journal of Applied Sciences – Vol. 13, No. 05
Publication Date: September 27, 2025
DOI:10.14738/aivp.1305.19436.
Mutuke, M., Katsande, D. I., & Sirimoyi, F. K. (2025). A Scoping Review on Technical and Vocational Education and Training (TVET) Practices for Environmental Sustainability in Zimbabwe. *European Journal of Applied Sciences, Vol - 13(05).* 196-202.

A Scoping Review on Technical and Vocational Education and Training (TVET) Practices for Environmental Sustainability in Zimbabwe

Mathias Mutuke
Chinhoyi University of Technology,
P Bag 7724, Chinhoyi, +263, Zimbabwe

Daphne Idith Katsande
Lupane State University, Bulawayo,
PO Box AC255 Ascot +263, Zimbabwe

Fortune Kudzai Sirimoyi
Ministry of Skills Audit and Development, Pax House,
9th Floor, 89 Kwame Nkrumah Ave, Harare, +263, Zimbabwe

ABSTRACT

This study aimed to conduct a scoping review of environmental sustainability practices in TVET institutions in Zimbabwe. The study's objectives were to identify interventions within Zimbabwe's TVET sector that promote environmental sustainability, to examine the various challenges being faced in the implementation of environmental sustainability approaches in TVET institutions in Zimbabwe and to proffer strategies to foster the implementation of sustainability approaches in TVET institutions in Zimbabwe. The PRISMA-ScR methodology was used to review both scholarly and gray literature from 2020 to 2025. The study's scope was based on green campus, green curriculum, green community, green research, and green culture. A sample of 47 documents were used in this scoping review. The scoping review's findings indicated that there were notable green initiatives that were being implemented by TVET institutions in Zimbabwe such as the installation of clean energy, green curriculum (although the adoption is uneven between private and public institutions), and community engagement programmes. However, some challenges are being faced such as financial constraints, bureaucratic delays to adopt a new curriculum that includes sustainability aspects, and incapacitated lecturers. Recommendations such as prioritizing investments in green infrastructure, shift in procurement policies, integration of sustainability concepts in the curriculum and provision of ongoing training for the lecturers were made.

Keywords: curriculum, environment, green, sustainability.

INTRODUCTION

During their establishment in Zimbabwe, Technical and Vocational Education and Training (TVET), were made to address the skills gap in the white minority community (Mufanechiya, Dube & Masengwe, 2024). Over the years, the black majority started enrolling in the institutions. TVET institutions were providing learners with practical skills in various trades,

occupations and vocations (Okoth, 2023). Enrollments in the TVET institutions have therefore increased over the years because of the ability of their programmes to make students more independent rather than relying on the government or the private sector for employment (Abd Hamid et al., 2023). In the 21st century, TVET institutions started focusing on addressing the challenges related to industrialization (McGrath, 2023). Institutions initially started focusing on huge production, and industrial skills development without focusing on the sustainability aspects (Deissinger & Gonon, 2021).

Recently, institutions started incorporating sustainability concepts in their institutions due to the climate-related crisis (McGrath, 2023). There has been a shift in the global market towards green jobs, green skills and green institutions. Through the adoption of an environmentally conscious behavour, TVET institutions will foster sustainable development in their institutions and beyond (Al- Nuaimi & Al-Ghamdi, 2022). Some of the advantages of adopting an environmentally conscious behavior are (i). students get exposure to sustainable technologies such as sustainable agriculture, renewable energy and sustainable agriculture (ii). Students can adopt eco-friendly practices in their lives and professional workplaces (iii). Get hands-on experience on environmentally friendly practices that facilitate a green economy (Ogur, 2023). Furthermore, TVET institutions have the role of reskilling and providing the human capital that can uphold environmental sustainability (ILO, 2023). Including environmental sustainability concepts into the curriculum in TVET institutions is the first step towards attaining sustainable development (Tee, 2023). TVET institutions can contribute towards sustainable development by managing the campus, integrating the concepts into the curriculum, adapting to the community, fostering research and promoting a green culture as indicated below Fig 1: environmental sustainability in TVET institutions

Green campus	Green curriculum	Green community	Green research	Green culture
Managing campus	Integrating ESD into the curriculum	Adapting community	Fostering research	Promoting culture
▪ Energy management ▪ Water management ▪ Waste management ▪ Pollution management	▪ Green technology ▪ Clean technology ▪ Green jobs ▪ Greening existing jobs	▪ Capacity building ▪ Renewable technology ▪ Resource support ▪ Unique practices	▪ Renewable energy ▪ Water treatment ▪ Green innovations ▪ Waste recycling	▪ Green values ▪ Green attitude ▪ Green ethics ▪ Green practices

Source: McGrath (2023)

Figure 1 shows the various aspects of environmental sustainability that can be adopted in TVET institutions. This study aims to conduct a scoping review of TVET institutions in Zimbabwe for environmental sustainability.

OBJECTIVES

1. To identify interventions within Zimbabwe's TVET sector that promote environmental sustainability.

2. To examine the various challenges being faced in the implementation of environmental sustainability approaches in TVET institutions in Zimbabwe.
3. To proffer strategies to foster the implementation of sustainability approaches in TVET institutions in Zimbabwe.

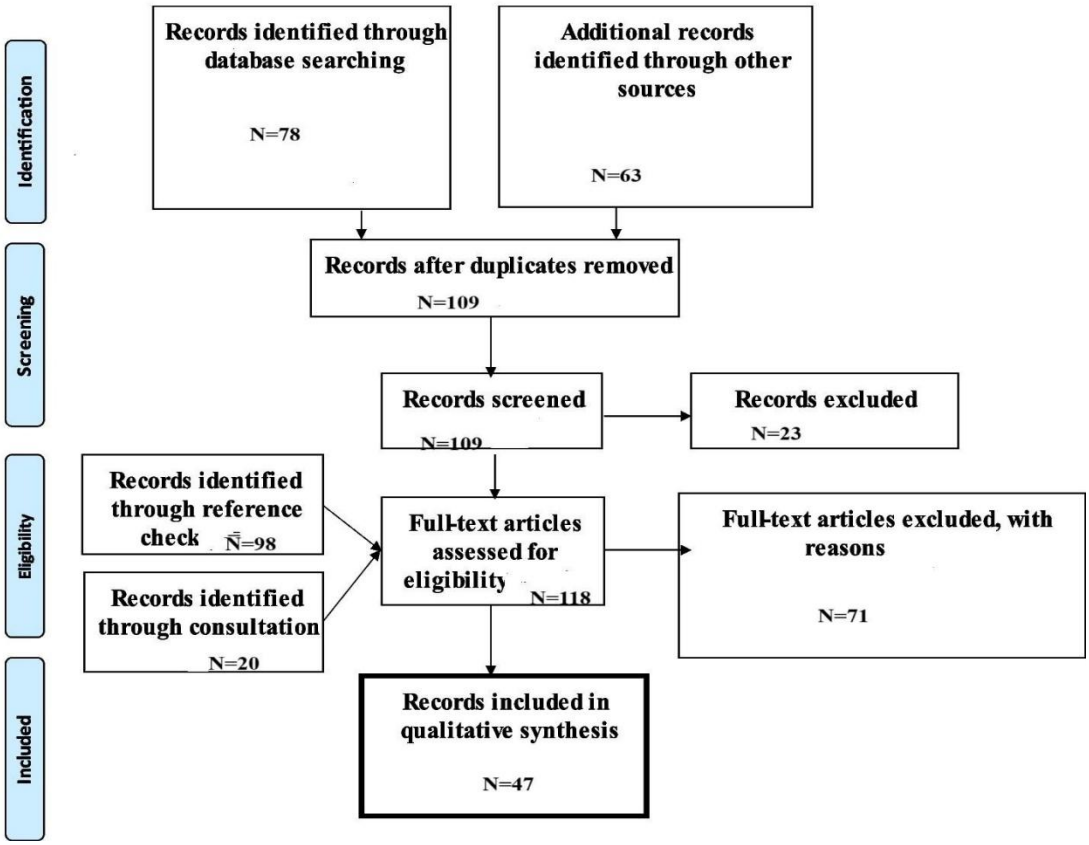
METHODS AND MATERIALS

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses for Scoping Reviews (PRISMA-ScR) were utilized for this scoping review. To search for literature related to environmental sustainability and TVET institutions in Zimbabwe, literature from 2020 to 2025 was sought. Both scholarly and gray literature were adopted for this research. The inclusion criteria for the literature were as follows;

- The publications or articles should be related to environmental sustainability and TVET institutions.
- Published between 2020 to 2025 o Green campus (energy sustainability, water sustainability, pollution, waste management) o Green curriculum (green jobs, sustainable technology, clean technology) o Green community (capacity building, renewable technology, clean-up campaigns) o Green research (waste recycling, renewable energy, water treatment, green innovation) o Green culture (values, attitude, ethics and practices) o TVET institution within Zimbabwe

RESULTS

The study's sample that was used in this study was n=47, which was obtained as follows



Through data identification, scholarly data related to TVET institutions was n=78. Gray literature was n=63. After screening n=109 documents. After verifying the documents for eligibility, of all the documents using the eligibility criteria, 47 documents were used in this study for document review.

INTERVENTIONS WITHIN ZIMBABWE'S TVET SECTOR THAT PROMOTE ENVIRONMENTAL SUSTAINABILITY

Managing the Campus

Most TVET institutions in Zimbabwe have been working towards greening their campuses. For instance, ILO (2022), provided a tool book for the TVET institutions which have been instrumental in the adoption of solar energy and a shift towards biogas systems. The solarization of the campuses has been done to reduce heavy reliance on electricity. Concerning pollution management, the TVET institutions have participated in tree-planting initiatives (United Methodist Creation Justice Movement, 2021).

Green Curriculum

The shift to the green curriculum first gained much interest in 2019, through the ILO and UNESCO green skills guideline, in partnership with the Zimbabwe National Qualifications Framework (ZNQF) (Mtisi, 2024). This initiative was done to meet Zimbabwe's Human Skills Capabilities and attainment of Vision 2030. Biogas training, for instance, is part of a broader effort to promote green skills and sustainable practices within Zimbabwean Technical and Vocational Education and Training (TVET) institutions. The International Labour Organization (ILO), in partnership with the Zimbabwean government and various stakeholders, is implementing training programs that include biogas systems installation as a core component (ILO, 2022). TVET institutions such as Young Africa, initiated the Greenovating TVET programme where the green curriculum is being introduced. These programmes include renewable energy (solar installations, biogas), sustainable farming, waste management, and environmental auditing. Manyati et.al (2024), indicated that over there years there has been an increase in TVET institutions managed by NGOs and private colleges offering the aforementioned programmes.

Adapting Community

Munyati et.al (2024), indicated that there are short courses, workshops and community-based initiatives that are being conducted by TVET institutions in Harare, focusing on solar installation and sustainable agriculture. ZELA (2021), notes that in rural communities, green initiatives especially agriculture-related are targeting women and the youth who were marginalized. Partnerships between TVET institutions, non-governmental organizations and the government, people in rural communities are also being educated about renewable energy technologies. For instance, the Zimbabwe Joint SDG Fund provided funding to TVET which was educating communities on clean energy initiatives to reduce deforestation.

Fostering Research

The scoping review indicated that International Non-governmental organizations such as UNESCO, UNEVOC and ILO were spearheading the research on the role of TVET institutions in attaining environmental sustainability (Manyati et.al, 2024). For example, research on the UNESCO-UNEVOC Greening TVET Guide, Greening TVET and Skills Development in Africa–

Green enter PRIZE Innovation and Development Project in Zimbabwe and Greenovating TVET.

THE CHALLENGES BEING FACED IN THE IMPLEMENTATION OF SUSTAINABILITY APPROACHES IN TVET INSTITUTIONS.

Mufanechiya, Dube & Masengwe (2024), indicated that financial constraints are the major impediment to the attainment of green campuses in most TVET institutions in Zimbabwe. The Zimbabwe Manpower Development Fund (ZIMDEF), which is responsible for providing resources to the TVET institutions has received allegations of corruption leading to them not being able to fund TVET institutions (UNESCO, 2022). The TVET institutions will require resources to upgrade to clean energy, efficient water systems, and even waste management systems. Moski et.al (2022), indicate that the challenge with the implementation of green curriculums is that National TVET institutions take time to adapt to new changes as the verification processes are cumbersome. ILO (2021), states that the lecturers themselves are also not qualified enough to be able to teach the new sustainable approaches required. Awareness among the community members on the importance of green communities is still low. The collaborations among the different partners in the industry are still low making the outreach programs less effective. In terms of fostering research, TVET institutions traditionally focus on skills development rather than research programs, making the research culture limited.

STRATEGIES TO IMPLEMENT ENVIRONMENTAL SUSTAINABILITY IN TVET INSTITUTIONS

To have green campuses, TVET institutions in Zimbabwe have to adopt energy-efficient measures, invest in renewable energy, and adopt water conservation measures (water harvesting and lowflow taps) (ILO, 2021). In regards to procurement of materials, there is a need for a shift towards environmentally friendly materials (UNESCO-UNEVOC, 2022). There is the need to integrate sustainability concepts in the curricula of all programmes, not just environmental sustainability (Chikunda, 2020). There is the need to engage students to embark on more community project as to raise awareness. Students should also be motivated to conduct researches that address the current environmental challenges that are being faced in their communities and at the TVET institutions. Companies and organizations can also partner with students in green projects.

DISCUSSIONS OF FINDINGS

The research findings indicated that there were initiatives being implemented in regards to environmental sustainability which were related to managing the campus, green curriculum, adapting to the community and fostering research. The findings indicated that the too book that was adopted was developed by ILO. The lack of a nationalized plan for TVET institutions to attain environmental sustainability impedes achieving it. The adoption of solar systems in TVET institutions has also been motivated by the electricity challenges in the country. In regards to the curriculum, the adoption of the green curriculum in formal polytechnics in Zimbabwe has been lagging in comparison to privately owned institutions. Kudakwashe (2021), asserts that the adoption of new programmes and curricula related to sustainability has been implemented in Universities in Zimbabwe, leaving behind TVET institutions. This is evidence that TVET institutions are left behind regarding sustainability issues. These findings

are in sync with the views of Olatunbosun & Mokwena (2022) who note that curriculum reforms in TVET institutions often take time due to insufficient training for the lecturers. Thus, there is a need for continuous updates of the curriculum and professional development for the lecturers.

Engagement with the communities through capacity-building initiatives remains a vital strategy for the inclusion of local communities. The research findings indicate that ZELA (2021), had initiatives to include women and the youth, which is in sync with the global standards as stipulated by ILO (2021). However, Mohideenbawa & Beegom (2021), indicate that for these initiatives to be effective, there is the need to include all community members including community leaders and civil society organizations. Participatory approaches are needed for community initiatives to be effective and for environmental sustainability to be attained. Green research in Zimbabwean TVET institutions is dominated by international organizations. As indicated by Manyati et al. (2024), the research culture and skills development to conduct environment-related research is low in TVET institutions. These findings align with the views of McGrath (2023). who asserts that most TVET institutions in developing countries lag in research linked to the needs of the industry. Thus, this research advocates for action-oriented research where the findings aim to address real environmental issues that are being faced in the Zimbabwean case.

This scoping review also showed that there were challenges that were being faced regarding the implementation of environmental sustainability measures. These challenges included financial constraints, bureaucratic delays and a lack of qualified lecturers, a traditional thinking of focusing on skills rather than research, which have hindered the adoption of environmental sustainability. Hence the rationale for the adoption of prioritizing investments in green infrastructure, shift in procurement policies, integration of sustainability concepts in the curriculum and provision of ongoing training for the lecturers.

CONCLUSIONS

This study aimed to conduct a scoping review of environmental sustainability practices in TVET institutions in Zimbabwe. The PRISMA-ScR methodology was used to review both scholarly and gray literature from 2020 to 2025. The study's scope was based on green campus, green curriculum, green community, green research, and green culture. The scoping review indicated that there were notable green initiatives that were being implemented by TVET institutions in Zimbabwe such as the installation of clean energy, green curriculum (although the adoption is uneven between private and public institutions), and community engagement programmes. However, some challenges are being faced such as financial constraints, bureaucratic delays to adopt a new curriculum that includes sustainability aspects, and incapacitated lecturers. Recommendations such as prioritizing investments in green infrastructure, shift in procurement policies, integration of sustainability concepts in the curriculum and provision of ongoing training for the lecturers were made.

References

Abd Hamid, H., Piahat, M. T., Azwan Haris, N. A. L., & Hassan, M. F. (2023). Shades of Gray TVET in Malaysia: Issues and Challenges. International Journal of Academic Research in Business and Social Sciences, 13(6), 2152–2167. https://doi.org/10.6007/ijarbss/v13 i6/16747.

Chikunda, C. (2020). Building Capacity for Green Skills in Zimbabwe's TVET Sector. Zimbabwe Journal of Educational Research, 32(1), 112-126.

Deissinger, T. & Gonon, P. (2021). The development and cultural foundations of dual apprenticeships. Journal of Vocational Education and Training, 73(2), 197–216.

ILO (2022). Greening TVET and skills development A practical guidance tool. https://www.ilo.org/sites/default/files/wcmsp5/groups/public/%40ed_emp/%40ifp_skills/documents/publication/wcms_847095.pdf.

Kudakwashe, K. (2021). Relevancy of new higher education approaches in 'second Republic Zimbabwe, in W Lee & S Waller (Ed)s Higher education. Rijeka; IntechOpen, Ch 9.

Manyati, T.K., Kalima, B.G., Owolabi, T. and Mutsau, M. (2024). Exploring the potential for enhancing green skills training, innovation and sustainable livelihoods in informal spaces of Harare, Zimbabwe: identifying gaps and opportunities. IIMBG Journal of Sustainable Business and Innovation, 2(1), pp.60–79. doi: https://doi.org/10.1108/ijsbi-06-2023-0036.

McGrath, S. (2023). Towards Sustainable Vocational Education and Training: Thinking beyond the formal. Southern African Journal of Environmental Education, Vol. 38(2).

Mohideenbawa, R. & Beegom, B. (2021). Participatory Approach for Community Development: Conceptual Analysis.

Mokski, E., Leal Filho, W., Sehnem, S. and Andrade Guerra, J.B.S.O. de (2022). Education for sustainable development in higher education institutions: an approach for effective interdisciplinarity. International Journal of Sustainability in Higher Education, 24(1), pp.96–117. doi: https://doi.org/10.1108/ijshe-07-2021-0306.

Mtisi, W. (2024). Skilled for the Green Economy. https://acqf.africa/capacity-developmentprogramme/webinars/2nd-nqf-forum-2e-forum-cnc-2o-forum-qnq-luanda/theme42_zimbabwe_greening-tvet-zimbabwe_w-mtisi_luanda.pdf/@@display-file/file/theme42_zimbabwe_greening-tvet-zimbabwe_w-mtisi_luanda.pdf.pdf.

Mufanechiya, A. Dube, B. & Masengwe, G. (2024). Exploring the Zimbabwean Technical and Vocational Education Journey: Challenges and Prospects. E-Journal of Humanities, Arts and Social Sciences (EHASS).

Okoth, O. (2023). TVET, economy and sustainable development. International Journal of Vocational and Technical Education.

Olatunbosun, J. & Mokwena, G. (2022). Lecturers' perspectives on challenges facing final-year engineering students at a TVET college in Nongoma, KwaZulu- natal by. 10.13140/RG.2.2.17973.49123.

United Methodist Creation Justice Movement, (2021). Sowing Hope: Planting Trees in Zimbabwe to Counter Climate Change. https://umcreationjustice.org/sowing-hope-planting-treesinzimbabwe-to-counter-climate-change/.

UNESCO, (2022). Education Sector: TVET Policy Review Zimbabwe.

UNESCO (2024). UNESCO, Joint SDG Fund contribute solar equipment for capacity building of technicians. [online] Available at: https://www.unesco.org/en/articles/unesco-joint-sdgfundcontribute-solar-equipment-capacity-building-technicians. [Accessed 25 May 2025].

UNESCO-UNEVOC (2022). Greening Technical and Vocational Education and Training: A Practical Guide for Institutions.

ZELA (2021). Towards sustainable and climate-resilient rural communities in Zimbabwe anchored on youth inclusion. – Zimbabwe Environmental Law Association. [online] Available at: https://zela.org/towards-sustainable-and-climate-resilient-rural-communities-inzimbabweanchored-on-youth-inclusion-and-participation/. [Accessed 25 May 2025].