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Integrating sustainability into higher education curricula to strengthen the sustainability-employability nexus via sustainable value chains (SEN-SVCs) in Ghana

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Abstract

While some Higher Education Institutions (HEIs) have started integrating sustainable practices into their training and development strategies to create sustainable value chains, many still find it difficult to justify adopting this emerging approach. This exploratory study asks to what extent sustainability practices are integrated in Ghanaian HEIs and how such integration can support sustainable value chains. Using descriptive analysis of secondary data from the QS World University Rankings: Sustainability 2025 for the four Ghanaian HEIs listed (University of Ghana, Kwame Nkrumah University of Science and Technology, CSIR-Ghana and University of Cape Coast), we found an average Equality (EQ) score of 38.58 and an average Employability and Opportunity Outcomes (EO) score of 47.30, an EO-EQ gap of 8.7 points, while no Sub-Saharan institution appeared in the global top 200 across the three impact categories. The findings highlight low impact and integration efforts by African HEIs, particularly in Ghana. We therefore recommend training and development programmes for staff, following the framework of our proposed Sustainability-Employability Nexus for Sustainable Value Chains, which requires dedicated effort and resource mobilisation. The findings are limited to four institutions and should not be generalised to all Ghanaian HEIs.

Subject Classification: *91B76, 90B50, 97B50, 97C70, 97B10, 91B82.*

Keywords: *Higher education institutions (HEIs), Sustainability practices, Training and development, Sustainable value chains (SVCs), Sustainability-employability nexus (SEN).*

1. Introduction

When it comes to sustainability education and practices in HEIs, there is some effort to implement programmes and curricula on sustainability, but there is still a sustainability skills gap in HEIs [1], while some HEIs in the West are adopting learner-centred modules based on sustainability audits [2], [3], others are also using their institution as a case study to close such a skills gap by engaging their students in business sustainability teaching and assessment methodologies [1].

This exploratory study investigates how sustainability practices are incorporated into the training and development programmes of HEIs in Ghana, utilising the QS World University Rankings: Sustainability 2025 data. It will assess the current level of integration, and explore how integrated sustainability practices can help establish and enhance sustainable value chains within HEIs.

The World Universities Sustainability Ranking, launched by Quacquarelli Symonds (QS), was created to raise awareness of environmental, social, and governance challenges within higher education. Starting with a pilot in 2022, the ranking was fully established in 2023 to assess universities' roles in sustainability solutions and services. It

highlights their function as education and research hubs and as leaders in advancing societal knowledge. The initiative aims to evaluate how higher education institutions tackle urgent issues like climate change and social equity.

2. Literature Review

The global demand for sustainable practices has positioned HEIs at the forefront of such transformative initiatives [4], as centres of knowledge creation and dissemination [5], they are uniquely positioned to influence societal values, shape future leaders, drive innovation and sustainability. Therefore, this literature review will concentrate mainly on the barriers encountered, stakeholder attitudes, and the role of sustainability practices in nurturing sustainable value chains within HEIs, drawing on diverse international perspectives and empirical studies.

2.1 *Barriers to integration*

Organisational Change in Sustainability. The barriers of organisation change in sustainability integration practices in HEIs are numerous, but one of the key barriers to overcome is the ability to identify the various forms of resistance to change and how best to manage such resistance to promote the culture of change. Blanco-Portela et al. [6] reviewed the key barriers to integrating sustainability practices into HEIs, highlighting the numerous barriers emanating from the resistance faced by change agents in their sphere of organisational change management towards a more sustainable institution.

Lack of Financial Resources. Implementing sustainability practices in higher education institutions call for financial inflow to manage the various changes that are likely to be implemented. Aleixo, Leal, and Azeiteiro [7] revealed in their study that the main barrier to implementing sustainability in Portuguese Public higher education institutions is the lack of funds as a result of reduced funding by the government and a decline in student enrolment, which restricts the institutions' ability to integrate sustainability practices in their various arms of practice within the institution.

Leadership. A study of Latin American higher education institutions by [8] identified lack of resources, insufficient leadership, and limited awareness as barriers hindering the smooth integration of sustainability practices. Leadership highlights the challenge or opportunity to maintain

momentum for sustainability practices when institutional leadership is changing, and the ability to engineer the flow with that transition in leadership. A case study of Kennesaw University highlights the barriers faced, and when identified and evaluated, could be resolved through empowerment using identified change drivers during periods of leadership transition [9].

Lack of Research. Investigating the barriers to sustainable campus operations implementation in HEIs, [10], identified the key barriers as lack of awareness, lack of knowledge, resistance to change, and insufficient communication, which significantly hinder the success of green campus initiatives. Filho et al. [11] identifies the lack of research on how planning supports performance assessment and goal achievement as the major barrier to sustainable practice development in higher education. This further limits institutions from effectively integrating economic, social, and environmental aspects of sustainability into their practices, thereby hindering their effort to improve education for sustainable development in their various institutions of higher learning.

Lack of Open Data Portals and Sustainability Reporting. Many public institutions and HEIs are reluctant to reveal all the necessary information about sustainability efforts, even though seen as a beacon to instil such discipline in all their stakeholders. Information as a key resource in the sustainability effort must be readily available with a public disclosure and open data access policy to help stakeholders use this information as a resource in their capacity-building efforts. While there is a clear indication of a lack of non-financial standards for assessing sustainability in HEIs [12]. Lněnička et al. [13] encouraged public institutions to develop open data portals to enhance the transparency effort and also make information as a resource available to all key stakeholders to engage in policy implementation, policy uptake and decision-making processes as a key factor in achieving the objectives of sustainability in HEIs. Sharing information openly does not seem to be an easy effort among HEIs in the global south, which hinders sustainability efforts, especially in their governance structures.

3. Methodology

This research adopts an exploratory design relying on extracted quantitative secondary data from QS World University Sustainability Ranking 2025, using descriptive statistical techniques to examine the integration of sustainability practices in HEIs of Ghana [14]. Although it

offers limited validity and value as a research design [15], [16]. This approach is considered appropriate given the limited time and resources available [17], [18]. Focusing on Ghanaian HEIs listed in the report, pre-existing numerical data was used to explore and identify patterns that need to be addressed by this study. Simple descriptive statistical analysis was used to gain further understanding of the study objectives [19]. This approach helped to reveal a more nuanced and comprehensive understanding of sustainability efforts and practices of HEIs in Ghana. This design further facilitates an in-depth understanding of institutional strategies and challenges related to sustainability integration, relying on the traditional approach of data preservation and sharing among scientists.

4. Results and Discussion

4.1 *QS World University Rankings-Sustainability 2025*

The top 200 HEIs based on regional geography across the world for Environmental Impact, Social Impact, and Governance have been drawn from the QS World University Rankings and presented in Figure 1.

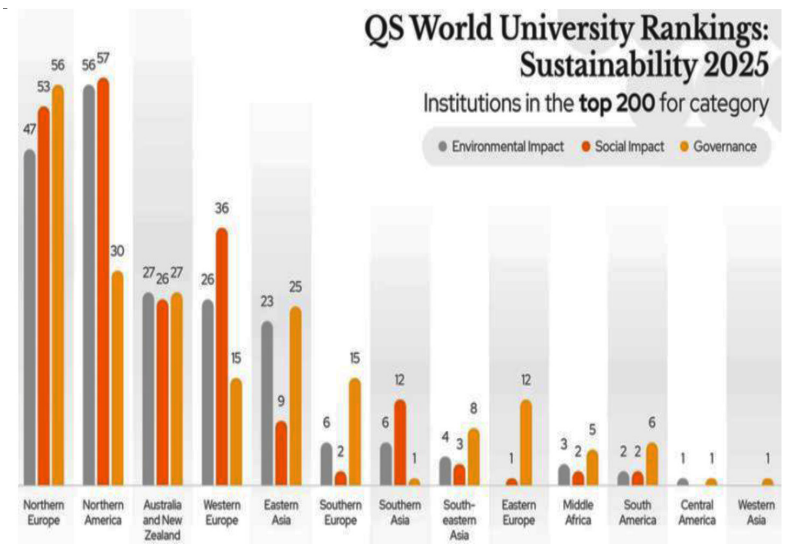


Figure 1

QS World University Rankings: Sustainability 2025 [14]

Examining the rankings offers many insights. The pictorial bar chart from Figure 1 reveals the performance of sub-regions around the world

for the top 200 HEIs. Northern Europe takes the lead, followed by Northern America. Middle Africa lags behind Western Asia at the bottom. There was no representation by Sub-Saharan countries for all the three categories namely environmental impact, social impact and governance which indicate the need for Ghana and all other Sub-Saharan countries to incorporate sustainability practices and policies in their training and development. This finding is very worrying and a concern for further qualitative analysis to find out the in-depth reason for such results.

4.2 *Sustainability Rankings in African HEIs*

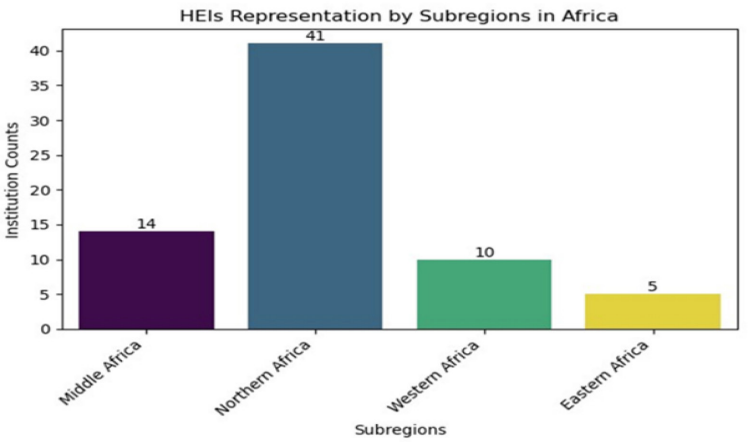


Figure 2

HEI Representation by Subregions in Africa [14]

The sector of HEIs in Africa is very dynamic and remains an uneven playing field for the institutions involved. There are over 1,300 officially recognised higher education institutions in Africa according to Times Higher Education. Figure 2 is drawn from the ranks of 70 HEIs across 14 reporting countries based on the QS Sustainability Ranking 2025 as indicated in Figure 2. It reveals the regional disparities in quality and sustainability efforts on the part of these reported institutions. The overall score for Africa reveals how few nations lead in the rankings and scoring, while others are lagging, and many are not represented.

4.3 *Sustainability Rankings in Ghana HEIs*

Contextualising Ghana's HEIs in the sustainability landscape is pivotal in helping identify appropriate sustainable practices to promote

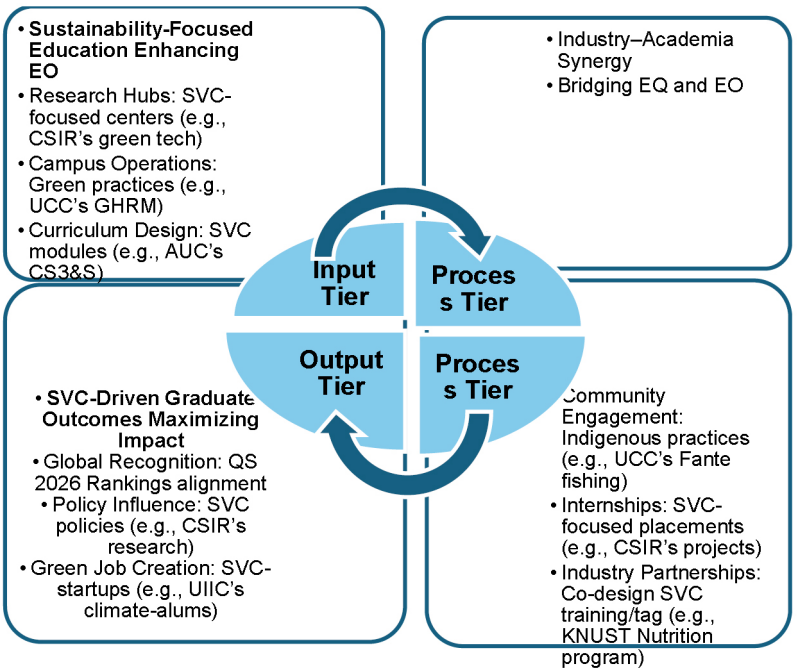
sustainable value chains in Ghanaian HEIs. Through the proposed framework of sustainable value chains (SVCs) made up of integrated policies and systems that enhance economic viability, social equity, and environmental stewardship across all sectors of the economy. The QS report captured data for only four Ghanaian HEIs out of the 278 accredited HEIs in Ghana. These were University of Ghana (UG), Kwame Nkrumah University of Science and Technology (KNUST), Council for Scientific and Industrial Research (CSIR), Ghana and University of Cape Coast (UCC). These institutions demonstrated an average score of 38.58 on EQ (Equality Indicators), indicating a low commitment to the issues of equality, such as gender parity in terms of students and faculty representation, women in leadership roles, diversity and inclusion policies, academic support to women and the disadvantaged in society. There is a need toa survey was conducted where managers were asked about their engagement in the sustainability issues and how it affects their competitive advantage. The study uses the structural equation modelling (SEM balance environmental, social and governance policies to create a more balanced impact in HEIs in Ghana.

Many Ghanaian HEIs lack structures for integrated planning [11], with limited access to governance data through their institutional portals [13]. Based on the data drawn from the analysis we propose The Sustainability-Employability Nexus for Sustainable Value Chains (SVCs) in Ghanaian HEIs.

4.4 *Conceptual Framework-The Sustainability-Employability Nexus (SEN) for Sustainable Value Chains (SVCs)*

The higher values in Employability and Opportunity Outcomes (EO) offer a unique opportunity to propose a Sustainability-Employability Nexus (SEN) for Sustainable Value Chains (SVCs) Conceptual Framework (SEN-SVCs), to embed sustainability practices into HEIs, which can simultaneously enhance Equality (EQ) through diversity, equality and inclusion practices, and EO (by aligning graduates with green value chains demands and trends of present-day organisations to create employment opportunities for graduating youth to help stem the tide of youth unemployment in Ghana). University of Ghana has a high EO score of 58.7, reflecting a strong score for employability strengths likely from their unique sustainability programmes, such as those run by the Centre for Climate Change and Sustainability Studies (C3SS). Kwame Nkrumah University of Science and Technology had an EO score of 55.5, being tech-

focused and running programmes such as Nutrition and Sustainable Value Chain programmes can integrate SEN-SVC by training students in circular economy models, such as agro-waste recycling, enhancing EQ through all hands-on labs and EO by linking it to agribusiness SVCs. Centre for Scientific and Industrial Research-Ghana had EQ 33.7, EO 37.6. Though with lower scores, this institution is uniquely placed with its advanced research works, especially on green technologies, which can support SEN-SVCs by providing empirical SVCs data for HEIs curricula, bridging the academic-industry gaps in our HEIs in Ghana. University of Cape Coast lags with scores of EO of 37.4, but with the Department of Environment, Governance, and Sustainable Development (DEGSuD) can also adopt SEN-SVC to improve EQ via blue economy SVC courses, such as sustainable fisheries, aligning with EQ with coastal industry needs. The uniqueness of the SEN-SVCs framework of leveraging the EO-EQ differential gap of 8.7 to propose a dual-impact model, which may be



Metrics / Indicators: EQ at 70.311; EO at 39.58

Figure 3

Proposed Conceptual Framework Integrating Sustainability and Employability to Drive Sustainable Value Chains in Ghanaian HEIs. Source: By Authors

testable through a longitudinal study in the future, with no prior study explicitly linking EQ-EO metrics to SVCs in Ghana, mapping how SEN-SVC translates sustainability training and development programmes into successful SVC outcomes, for example, reducing carbon footprints in Ghana's cocoa export. By proposing the SEN-SVC framework, this study offers a multi-faceted data-driven novel approach grounded on the insights from the QS Sustainability Ranking 2025 data. Using the Input-Process-Output (IPO) model it proposes SEN for SVCs by visualising its operation by outlining the inputs (resources, data and conditions that go into it), the processes (the actions, methods, and the transformation performed on the inputs) and the outputs (the results, products, or outcomes that emerge from the process). The proposed framework is presented in Figure 3.

Input Tiers: It begins with Sustainability-Infused Education (Enhancing EQ), focusing on equality and quality to reform HEIs' curricula and practices to reflect the best sustainable practices in the global north. Embedding sustainability principles tailored to grow SVCs across all HEIs in Ghana. This can be achieved through curriculum design aimed at introducing interdisciplinary modules on SVCs such as sustainable procurement (UG's C3SS), green logistics (KNUST's engineering programmes, and blue economy practices (UCC's DEGSuD).

Process Tiers: Engendering and promoting industry-academia synergy processes to bridge the gap between EQ and EO. Fostering partnerships between HEIs, Industry, and communities to align sustainability education with employability. This must be based on the principle of training and development that is tied to the needs of industry. This will leverage the EO average strength of 47.30 to ensure graduates are equipped for SVC-created and emerging roles in sustainability.

Output Tiers: SEN-SVC-Driven Graduates to maximise impact through graduate employment by industries in Ghana. Promoting sustainability-employability assessments to enhance EO/EQ scores, green job placements and SVC innovations. Green job creation by training graduates in SVC services, leading start-ups in sustainable agribusinesses to address the perennial youth unemployment in Ghana.

5. Conclusion, Recommendations & Implications

Based on the data collected, analysis, and discussion outcomes, it is evident that more concerted efforts are needed to embed sustainability practices into Ghanaian HEIs through deliberate actions by all stakeholders.

The new proposed SEN-SVC concept allows HEIs to develop SEN-SVC hub centres that support and improve graduates' employability and preparedness for emerging green transition industries. For SVC, HEIs should adopt a comprehensive approach, including curriculum reforms to integrate the SEN-SVC concept and forming partnerships with various industries to reach that ultimate goal.

This study has limitations. The QS report covers only four Ghanaian HEIs out of the 278 accredited institutions in Ghana, and the analysis relies on descriptive secondary data, so the findings cannot be generalised to all Ghanaian or African HEIs. The proposed SEN-SVC framework is also conceptual and has not yet been empirically tested. Future research should include a larger and more diverse sample of institutions, qualitative inquiry into the reasons for low sustainability integration, and longitudinal studies to test the framework.

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