Inclusion of green economy and sustainability programs in higher education institutions: Examining the case of Kenyatta University, Kenya

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Higher education institutions play a pivotal role in instilling green economy and sustainable development principles in students. There are complex environmental challenges, and breaking through this complexity necessitates the incorporation of green economy learning to assist students in understanding these complex connections. This study explores the inculcation of interdisciplinary learning at the Master’s level of assessed green economy aspects among ten schools. It explores green economy topics in courses and the degree of action-oriented learning. Results from the total respondents (N=227), indicate, among the existing green aspects in sampled schools, the sustainable use of natural resources (n=108, 47.6%) thematic area was the most dominant across the Master’s courses. Examination of green learning in schools shows a disparity amongst schools where the school with the most examined green aspects was engineering and technology (93.8%) with the school of economics as least examined (75%). Cumulatively, green aspects, even with skewed disparity, were taught across the ten schools (p = 0.000). It is recommended that university programs should enhance regular reviews of curriculum and coursework in different disciplines, to set precedence on emerging green economy studies and their relevance.

Key words: Green economy, interdisciplinary learning, higher learning institutions, green skills, action-oriented learning, sustainability.

INTRODUCTION

For over ten years, the green economy has remained a topic of interest that has gained momentum among academicians and global leaders (Odiyo et al., 2022). The term “green economy” refers to an economy that is low-carbon, resource-efficient, and socially inclusive (Ngare et al., 2022; Dmuchowski et al., 2021). In a green
Green economy learning skills in universities

For the world to transition to a low-carbon economy and achieve social, environmental, and economic sustainability, green skills are needed. Green skills first appeared with the invention of green technologies; whereby green skills were required for operations. This now shows why it is important to embrace green skills in today’s development (Rosenberg et al., 2020). Green skills are the abilities, knowledge, values, and attitudes needed to achieve sustainability. Green skills will help learners prepare for jobs in industries other than their current one. Green skills are essential for green jobs that contribute to preserving the quality of life, the environment, and social economic equity (Sern et al., 2018). Changes in demand in the labor market result from a green economy. According to the literature, there is currently a low workforce with green skills, and many of these green skills are required in various sectors to promote sustainability. Although the job industry sectors require these green skills, most of the learning institutions have not yet included green skills learning in their learning strategy. Inadequate response to green skills training in educational institutions has far-reaching consequences for industries and the economy as a whole (Lotz-Sisitka and Ramsarup, 2019). In most developing countries, governments and institutions of learning have failed to address the green skills challenges that come with environmental issues and climate change. This shows that the training system is often isolated and this impacts negatively on the greening of industries and the green economy. The academic community has identified the need for green skills to facilitate the transition towards a green economy (Pavlova, 2018). Most occupations require green skills in order to appreciate the demands and issues that come with the greening of economies. According to a study conducted by the Organization for Economic Cooperation and Development (OECD)…ref, most countries have implemented environmental-related training programs, but have not included green skills in their learning strategy, particularly in developing countries, and Kenya is not an exception. Incorporation of green competencies should embed the teaching, educating, and professional competencies that are vital to promote the establishment of relevant strategies that contribute to green skills in learning institutions (Diep and Hartmann, 2016). There is a high demand for green skills in the fields of vocational education, universities, colleges, and also curriculum development. Additionally, there is less appropriate content for curriculum and design in the learning tasks in regards to green skills training. The curriculum of the learning institutions fails to meet the needs with respect to green skills. According to Kamis et al. (2016), 21st century green skills are essential and they are included in the list of skills that learners require to compete in the globalization era. The green economy has the ability to influence skills in green development, green technology development, and the development of green skills among workers. However, there are several green skills challenges that exist in training and education programs that require urgent action, one of them being inadequate capacity, resources, and inadequate support from relevant governments.

Interdisciplinary learning and green economy studies inculcation

According to Sikand et al. (2021), interdisciplinary learning education offers a collaborative approach that
education has sparked the twenty-first century, such as climate change and environmental pollution. Green economy has a capacity that provides a comprehensive and strong interdisciplinary approach based on environmental science rather than being in the sub-set of economics however it has gained a slow intake (Bassachs et al., 2020). Severity of environmental crises requires a more radical curriculum, and this implies that a model of interdisciplinarity teaching in institutions is required.

Higher education institutions play a critical role in educating students about the importance of a green economy and long-term sustainability. It is necessary to teach students about the green economy in order to fully comprehend these complex connections in the environment (Krishnan and Nandhini, 2020). The transition to a green economy has sparked the development of green skills so as to fulfill the requirements of green-collar employees. Green economy education and teaching will act as a catalyst for graduates to enter the green job market. Elements of green learning need to be applied as early as possible to students so as to make them competent citizens in all aspects and to maintain environmental balance (Thirupathy and Mustapha, 2020). For green economy studies to be taught at learning institutions, new educational curricula are required so as to help professionals develop appropriate skills and knowledge. There are currently few university courses developed that deal with green economy, indicating a significant gap and the need for more green economy study courses and learning in institutions. Although many higher education institutions around the world began introducing environmental-related programs, sustainability and green economy aspects have recently become a hot topic. According to Wang and Teng (2019), education in the twenty-first century must prepare students to face interconnected social, economic, and environmental problems. This now calls for interdisciplinary learning among students to foster a green economy and a sustainable future.

### METHODOLOGY

#### Scope

The study was conducted at Kenyatta University targeting postgraduate students. The university has a total of seventeen schools that embed interdisciplinary learning in their curriculums and research. A descriptive research survey design guided the study targeting over 50% of total seventeen schools in the institution where, 10 schools (58%) took part. Approximately 300 respondents were targeted, where only 227 respondents responded to the survey through systematic random sampling, giving 75.6% response rate. A response rate above 70% (≥0.7) is reliable when conducting field research studies (Amirrudin et al., 2021).

#### Distribution of schools’ response index

The response indexes for the ten schools were as follows; School of pure and applied science (8.81%), School of public health and applied human sciences (9.25%), School of humanities and social science (9.25%), School of hospitality, tourism, and leisure studies (9.25%), School of engineering and technology (7.05%), School of economics (8.81%), School of creative and performing arts, film and media studies (8.81%), School of business (8.81%), and School of agriculture and enterprise development (11.89%) (Table 1).

#### Sampling and exclusion criteria

The study purposively sampled schools. Schools with more than three departments and at least four postgraduate programmes were selected. Master’s students were randomly selected from the ten schools with a requisite being an ongoing student in a respective masters programme at Kenyatta University.

#### Data collect and analysis

Closed ended questionnaires with key thematic areas on green

### Table 1. Student participation across ten schools.

| Sampled Schools                                      | Response (n) | %  |
|-----------------------------------------------------|--------------|----|
| School of pure and applied science                  | 20           | 8.81% |
| School of public health and applied human sciences  | 21           | 9.25% |
| School of humanities and social science             | 21           | 9.25% |
| School of hospitality, tourism, and leisure studies| 21           | 9.25% |
| School of engineering and technology                | 16           | 7.05% |
| School of economics                                 | 20           | 8.81% |
| School of environmental studies                     | 41           | 18.06% |
| School of creative and performing arts, film and media studies | 20 | 8.81% |
| School of agriculture and enterprise development    | 27           | 11.89% |
| School of business                                  | 20           | 8.81% |
| **Total**                                           | **227**      | **100%** |

Source: Authors
RESULTS AND DISCUSSION

The extent to which your school provides courses in green economy and sustainability

The respondents indicated the extent to which their respective Master’s programmes provided that inculcated green economy and sustainability aspects. The following green economy topics were assessed: green economy, renewable energy, green financing, green innovation and technology development, sustainable use of natural resources, green design or architecture, environmental policy and management (Table 2). Results in Table 2 show assessment of relevant topics from postgraduate programmes across different schools. Green economy (n = 61, 26.9%) was moderate, education for sustainable development (n = 72, 31.7%, SD 0.990) was slightly, green design and architecture (n = 73, 32.2%, SD 1.292) was moderate, green financing or investment (n = 61, 26.9%) was moderate, and promoting the creation of green jobs (n = 70, 30.8%, SD 1.275) was moderate. The result clearly indicates that sustainable use of natural resources (n=108, 47.6%, SD 1.184) is the key significant course that was dominant across all Master’s courses. Thus, it indicated the extent to which they had interacted with green studies thematic areas in courses within their disciplines. These findings echo (Mikhno et al., 2021) that green economy studies have become critical globally and domiciling them in academia could transition interdisciplinary learning aspects and minds through curriculum development. The world is progressing, but not at the rate envisaged, as individual countries demonstrate leadership by enacting national green growth and economic strategies that promote academia. Several large-scale initiatives have enhanced development while remaining sustainable (Ali et al., 2021). We may look to the Republic of Korea, which has a national strategy and a five-year plan for green growth, Mexico City, which has successfully pushed bus rapid transit (BRT), and China’s renewable energy program as models. Namibia, in Africa, has successfully managed its natural resources to support the economy, society, and climate, exemplifying the word sustainability (D’amato and Korhonen, 2021). This is driven with green economy and competent learning paradigm. For instance, unemployment among Kenya’s youths has reached crisis proportions. According to Kenya’s National Bureau of Statistics, 39% of the country’s 13.7 million youths are jobless (Shah et al., 2021; Alushula, 2020). This alarming unemployment trend can be addressed through interdisciplinary studies, green skills inculation and

| Green economy topics in courses                          | DK  | N   | SL  | M   | Si  | SD  |
|----------------------------------------------------------|-----|-----|-----|-----|-----|-----|
| Globalization and sustainable development                 | 12  | 5.3 | 12  | 5.3 | 34  | 15  |
| Education for sustainable development                     | 7   | 3.1 | 5   | 2.2 | 72  | 31.7|
| Green economy                                             | 10  | 4.4 | 56  | 25  | 55  | 24.2|
| Environmental policy and management                       | 7   | 3.1 | 25  | 11  | 63  | 27.8|
| Land ethics and sustainable agriculture                   | 10  | 4.4 | 45  | 20  | 75  | 33  |
| Urban ecology and social justice                          | 13  | 5.7 | 43  | 19  | 72  | 31.7|
| Environmental philosophy                                  | 20  | 8.8 | 46  | 20  | 77  | 33.9|
| Population, women and development                         | 7   | 3.1 | 33  | 15  | 55  | 24.2|
| Renewable energy                                          | 13  | 5.7 | 29  | 13  | 70  | 30.8|
| Green design/architecture                                 | 26  | 11.5| 51  | 23  | 37  | 16.3|
| Green financing/investment                                | 26  | 11.5| 43  | 19  | 47  | 20.7|
| Sustainable use of natural resources                      | 10  | 4.4 | 21  | 9.3 | 35  | 15.4|
| Promoting creation of green jobs                          | 17  | 7.5 | 35  | 15  | 45  | 19.8|
| Green innovation and technology development               | 18  | 7.9 | 33  | 15  | 36  | 15.9|
| Reduction of environmental health risks                   | 8   | 3.5 | 28  | 12  | 68  | 30  |

DK-Don’t Know; M-Moderately; N-None; SL-Slightly; SD-Standard Deviation.
Source: Authors
competence-based curriculum.

**Action-oriented green economy learning method**

Green economy learning and its applications in ten schools at Kenyatta University are shown in Figure 1. The learners were assessed to ascertain the extent to which application of action-oriented teaching and learning methods and programs can address green economy and sustainability. The results indicate that, on a scale of five, slightly (38.8%), significantly (7.5%), none (8.4%), moderately (37%) and do not know (8.4%) respectively. From the findings, the respondents indicated that the existing programs slightly or moderately addressed green issues at 38.8 and 37% respectively. Even with this response tally, some responses did not know nor felt if action learning method was inculturated in the programs. It is therefore imperative to ascertain the route for such a response within the existing university curricula. Upscaling green economy skills is integral towards attainment of holistic interdisciplinary learning in academia (ONeill and Gibbs, 2014). In addition, Table 3 shows three probable appropriate teaching and learning methods for green studies at Kenyatta University. Of all the respondents (n = 227, 100%), majority of the respondents preferred an action-oriented teaching method (n = 152, 67%). The other teaching and learning methods recorded were holistic teaching and learning methods (n = 68, 30%) and learning through all senses (n = 7, 3.1%) (Table 3). This therefore shows green economy teaching to be embedded more in an action-oriented approach. However, from the findings, actionable green learning needs more upscaling, like the participatory action-oriented study of Green Care in Finland (Moriggi, 2021). More information on the significance of green care practices for processes of place-based sustainability transformations that can be emulated by Kenyan higher education institutions is provided in the study. As the world's population grows, many people are struggling to make ends meet, and the significant majorities are university graduates (Munro, 2011). While many blame the government for the lack of employment opportunities, companies appear to have a different perspective (Kamau and Wamuthenya, 2021). For them, the educational system has not provided

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**Figure 1.** Green economy action learning and sustainability issues.  
Source: Authors

**Table 3.** Preferred green economy and sustainability teaching and learning method.

| Appropriate teaching and learning method                     | N   | %  |
|-------------------------------------------------------------|-----|----|
| Action-oriented teaching and learning method                | 152 | 67 |
| Holistic teaching and learning method                       | 68  | 30 |
| Learning through all senses                                 | 7   | 3.1|
| **Total**                                                   | **227** | **100** |

Source: Authors
enough relevance to the labor market. Graduates are seen to be lacking in the skills required to prosper and support local organizations, civil society, enterprises, and civic institutions. This issue includes a lack of planning, inventing, and problem-solving skills (Tilak and Choudhury, 2021). To reduce poverty and environmental damage, green materials use at our lecture halls and teaching graduates the green skills is critical for a transformative green economy.

Assessment of green economy and sustainability aspects in coursework

Figure 2 show an examination of green economy aspects in coursework. The Master’s students (N = 227) indicated their responses accordingly. From the three choices of response, the majority of the students (n = 147, 64.7%) responded “Yes,” the No responses were recorded (n = 59, 26%), and those who did not know were recorded (n = 21, 9.3%). The results therefore indicated the penetration of green economic and sustainability aspects during course examinations. A greener economic learning model is one that is well versed in different academic programs offered to learners (Breed and Mehrten, 2022; Lee et al., 2019). The findings agree with Newton et al. (2014) that it is widely assumed that new educational curricula are required to provide professionals with the necessary knowledge and abilities to successfully expand the green economy. At the moment, there are just a few institutions of higher learning that are devoted solely to the green economy, owing to its recent beginnings.

Postgraduate students’ response on examination green economy aspects per school

The assessment of the green economy and sustainability per school is shown in Table 4 respectively. The results show the School of Engineering and Technology leading all other schools with a response rate of n = 15, 93.8%), followed by the School of Environmental Studies (n = 36, 87.8%). The 3rd highest response was from the School of Agriculture and Enterprise Development (n = 20, 74.1%). Other schools had a response rate of above 50%, meaning an above average examination of green economy aspects in exams. However, only two schools had a leading negative (No) response; the school of economics (n = 15, 75%) and the school of pure and applied sciences (n = 12, 60%) (Table 4). Learners tend to respond differently to how they perceive interdisciplinary programs. Green economy learning is an emerging concept on which global higher institutions of learning base their focus (Sharma and Sharma, 2021).

To check on the significance of the association between school and the students’ response to the question, "Are green economy and sustainability aspects assessed or examined in theory coursework?" Table 5 shows a significance index ($\chi^2 = 37.267, df = 9, p = 0.000$). Therefore, the students’ responses were found to be significant.

Conclusion

Achieving sustainability will necessitate training processes at various levels as well as teaching programs in green economy and sustainability (Abd et al., 2019). Institutions need to include green economy leaning in every degree and educational program taught. This will ensure learners work in productive sectors. Learners fail to connect theory with practice, and therefore, inclusion of green economy learning will help design students translate conceptual approaches into practice (Affolderbach, 2020). The green approach is taking a step ahead with the integration of green economy teaching in schools. The vital aspects of green economic studies are to impart positive knowledge and skills so as to impart positive and best practices from generation to generation. The aim of green economy teaching is to create a sustainable mindset in terms of social, environmental, and economic sustainability. Green economy teaching should be aimed at empowering learners with the ability and desire to work towards sustainable development.

Recommendations

Interdisciplinary programmes in the institutions of higher learning should be developed that domicile green economy aspects where, green skills and research are visualized. Institutions of higher learning should therefore strive to green learning, research, operations, and service in order to model and educate for sustainability to fulfill their mission and better prepare students for citizenship and green jobs. A number of green programs and
initiatives are helping to shift higher education culture toward a goal of sustainability. A periodic review of curriculum provides new perspectives on the educational setting, the subject matter being taught, and the educational process. The new ideas from the review call for a much more integrated and comprehensive strategy for formal education to include green co-curricular activities on campus and in the community, and they must be implemented promptly. University programs should enhance regular reviews for curriculum and coursework in different disciplines to set precedence on emerging green economy studies and its relevance.

### CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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