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Sustainability Practices in Nigeria Higher Education Institutions: The Case Study of a Public Tertiary Institution in North Western Region of Nigeria

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Abstract: In many developed nations, higher education institutions (HEIs) are increasingly promoting environmental sustainability through their teaching, research, operations, and practices. However, many HEIs in Africa have yet to give sustainability practices significant attention. This study appraises the current status of sustainability in one public higher education institution in Nigeria and the challenges that inhibit the integration of sustainability into its operations and practices. The survey included 141 randomly selected undergraduates and 5 purposively selected staff members. The results reveal that the school has made progress in teaching courses that promote environmental sustainability. However, only limited achievements have been made in integrating sustainability into its operations and practices. The major challenges of environmental sustainability in the school are the absence of a formal sustainability policy, lack of funds, and the absence of designated offices and positions for sustainability. Significant progress in sustainability education and practices can be achieved through the formulation of a sustainability policy, greater collaboration with other HEIs, and the establishment of sustainability offices and positions.

Keywords: *Higher education institutions, Sustainability, Sustainability policy, Teaching*

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1. Introduction

The rapid increase in population in many regions of the world and its attendant pressure on the environment, particularly natural resources, as well as the connections increasingly being made between human actions and existential threats such as climate change, ozone layer depletion, and desert encroachment, led to the coinage of the term "sustainable development" in the second half of the 20th century (Henson et al., 2007; Sachs, 2015). Sustainable development has been defined in various ways by many authors; however, one of the most popular definitions was provided in the 1987 Brundtland Report, where it was defined as "development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs" (Brundtland, 1987). The concept has since been embraced by many organizations and nations, such as the United Nations, through various conferences (e.g., the 1972 UN Conference on the Human Environment in Stockholm and the 1992 UN Conference on Environment and Development in Rio de Janeiro) and continues to spearhead the inclusion of sustainable development in human activities worldwide (Sachs, 2015; Alam, 2018). The Brundtland Report, a product of a United Nations Commission, helped to increase discussions on sustainable development and succeeded in pushing for a global response to the rapid ecological decline being experienced on Earth (Brundtland, 1987; Henson et al., 2007; Alam, 2018).

In 2002, the United Nations initiated the Decade of Education for Sustainable Development (DESD) with the primary goal of promoting "a world where everyone has the opportunity to benefit from education and learn the values, behavior, and lifestyles required for a sustainable future and positive societal transformation" (United Nations Educational, Scientific and Cultural Organization,

2005). While the DESD is being promoted in all tiers of education, higher education institutions are seen as key players in helping to curb environmental degradation and promote the transition to a more sustainable society (Henson et al., 2007; Stephens & Graham, 2010). Stephens et al. (2008) identified four ways higher education institutions could promote the societal transition toward sustainability: promoting sustainable practices in the campus environment; teaching students sustainability concepts and how to tackle sustainability challenges; embarking on research that addresses the sustainability challenges prevalent in society, and engaging with individuals and institutions (within and outside HEIs) in collaborative transdisciplinary efforts to tackle sustainability challenges. Alshuwaikhat and Abubakar (2008) grouped the sustainability roles for higher education institutions into three broad classes, namely; adoption of Environmental Management Systems (environmental management and improvement; and green campus); public participation and social responsibility (public participation; community services and social justice); and sustainability teaching and research (conferences, curriculum, research and development).

Over 500 University administrators in more than 50 countries made commitments in 1990 to promote sustainability when they signed the Talloires Declaration, which has a 10-point action plan for incorporating sustainability and environmental literacy in teaching, research, operations, and outreach in their various HEIs (UNESCO, 1990). In Boren et al.'s (2010) study of ten United States higher education institutions' efforts in sustainability, it was observed that all the universities have commenced steps toward achieving more sustainable practices. Nine out of the ten schools studied have adopted the Leadership in Energy and Environmental Design (LEED) policies and practices in new projects, and six have energy goals that have significantly reduced their energy consumption. Koc's (2014) assessment of sustainability in universities across the United States, Canada, and Europe reveals that most universities find it easy to implement practices like waste recycling, landscape, and transportation sustainability, while practices that require investments and infrastructure expenditure like renewable energy production, wastewater recycling, and rainwater harvesting are applied rarely and cover a small percentage of the campus area. The studies conducted by Boren et al. (2010) and Koc (2014) show the implementation of sustainable practices in HEIs is varied. The studies identified the lack of adequate funds to execute projects that integrate sustainability principles as a major challenge for HEIs. Other challenges were a lack of commitment by school administrators, difficulty in translating talk into action, and lack of strategic vision.

While there is a growing number of research on environmental sustainability in HEIs in developed nations, the reverse is the case in Nigeria. The few available studies on sustainability in Nigerian HEIs concentrated on the inclusion of sustainability in the curriculum (Akeel et al., 2018; Ogunode et al., 2019), without considering operations and practices that promote sustainability. Therefore, this study examines sustainability education and practices in the Air Force Institute of Technology (AFIT), Kaduna, Nigeria, a public HEI located in the North-Western region of Nigeria. The objectives of this study were to (i) examine the inclusion of sustainability in academic activities; (ii) examine operations and practices of sustainability, and (iii) identify challenges to sustainability in AFIT. These objectives would provide insight into the extent to which the institution is sustainable in both its operations and academic-related activities. Furthermore, the holistic assessment in this study will address the critical gap that exists in studying sustainability practices and operations of HEIs in Nigeria.

2. Materials and methods

In this study, two sets of questionnaires were administered to the participants (students and staff of AFIT). A probability sampling technique was adopted in the selection of participants from among the undergraduates in the survey. The questionnaire was administered to 141 undergraduates randomly selected from across the six faculties and 5 staff members purposively selected from the unit responsible for the supervision of construction projects and facility management. The 5 staff members chosen out of the 9 staff members in the unit are those with job descriptions directly related to the supervision of construction projects and facility management.

The questionnaire, containing both close-ended and open-ended questions, is an extract of the Sustainability Assessment Questionnaire (SAQ) for Colleges and Universities, designed by the Association of University Leaders for a Sustainable Future (University Leaders for a Sustainable Future, 1999). The SAQ provides a quick snapshot of where AFIT stands in terms of sustainability and helps in identifying its areas of strengths and weaknesses. Shriberg's (2002) study of assessment tools used for the assessment of sustainability in HEIs showed that the SAQ is suitable for small campuses and contains attributes that are not difficult to measure, thus increasing its appeal for assessment purposes.

The SAQ contains questionnaire items in some crucial dimensions of higher education, namely curriculum, research and scholarship, operations, faculty and staff development, outreach and services, student opportunities, and institutional mission and planning. The areas of focus in this study: curriculum, research and scholarship, operations, and administration, mission, and planning; were adequately covered by the SAQ items. The choice of this assessment tool out of several assessment tools designed to appraise HEIs' environmental sustainability is because 1) The Air Force Institute of Technology Kaduna is a relatively small university, with less than a 6,000 student population, and 2) it can identify areas where improvements need to be made and enable the institution to set sustainable goals.

The Statistical Package for the Social Sciences (SPSS) V23.0 and Microsoft Excel software were used to analyze

the quantitative data obtained from the surveys. The descriptive statistics used include the mean, frequencies, range, and percentages to summarize and highlight the underlying characteristics of the data. The qualitative data obtained from the open-ended questions was quantified following the steps outlined by Creswell (2009), which are: i) creating themes qualitatively; and ii) counting the number of times the themes occur.

3. Results and discussion

3.1. Respondents' characteristics

Table 1: Characteristics of Undergraduate Respondents

		Frequency	Percent
Faculties	Faculties of Computing and Science	30	22.3
	Faculties of Engineering	84	59.6
	Faculty of Social and Management Sciences	27	19.1
	Total	141	100.0
Gender	Female	40	28.4
	Male	101	71.6
	Total	141	100.0

There were two groups of respondents in the study, undergraduates and members of staff of the Air Force Institute of Technology. The highest proportion (about 60%) of the student respondents in the study were from the faculties of engineering. The number of engineering departments in the school accounts for about half of the total programmes in the institution, and the student population is currently skewed in favour of the engineering disciplines. The faculty of Social and Management Sciences has the least (19.1%) representation in the study. Females account for less than one-third (28.4%) of the respondents. This is not unusual, as it is a reflection of students' intake not only in the school but in the country. The National Bureau of Statistics (2017) showed females make up about one-third (35.9%) of undergraduates' enrollment in Nigeria's Federal universities. The gender composition of respondents in this study is representative of the gender distribution of undergraduates in the country and the HEI; this and the proportional representation across the faculties are factors that make the results of this study generalizable to the entire AFIT student population.

Table 2: Characteristics of Staff Respondents

Respondent	Qualification	Years of Work Experience	Area of Expertise
1	PhD	25	Architecture
2	Higher National Diploma*	12	Civil Engineering
3	Postgraduate Diploma	10	Quantity Survey
4	Higher National Diploma*	5	Civil Engineering
5	Higher National Diploma*	10	Quantity Survey

*Higher National Diploma is the highest certificate offered in Nigerian polytechnics

The staff who participated in the study have work experience that ranges from 5 years to 25 years, with 80% of respondents having more than 10 years of work experience in the field (see Table 2). These long service years are an indication that they have had countless responsibilities in the supervision of construction projects and facility management. In addition, they have sufficient experience to give the required responses to the questionnaire items. All the staff have higher education certificates, with one of them having a PhD; it shows they can be able to read and understand the questionnaire items. The five staff members are from diverse fields of expertise, whose job descriptions in the school make them fit to answer the questions on the operations and practices of sustainability in the school.

3.2. Sustainability in academic activities: Curriculum

About three-quarters, (75.9%) of the students in the study indicated that the inclusion of topics related to environmental sustainability is ''quite a bit and a great deal'' (see Table 3). Slightly less than one-quarter (24.1%) believed that sustainability-related topics were 'a little' in their curriculum. None of the respondents indicated that they have not been exposed to sustainability-related topics. A review of the curriculum used in the school shows it has embedded into it topics related to sustainability at three levels; university-wide, faculty and departmental courses. At the university-wide level, the course ''Environment and Sustainable Development'' is a general course and all undergraduates in their second year of study are required to offer it. Having well-informed students through grounded curriculums, which provide them with necessary information is one of the goals of AFIT. Hence, the incorporation of sustainability education across all disciplines. The findings in this study align with the direction and strategy outlined for HEIs that want to adequately promote sustainability in Alshuwaikhat and Abubakar (2008), Branje (2013), Yan (2015) and Sugiarto et al. (2022), who opined that sustainability should be infused into courses and curriculum for all

disciplines in HEIs. In the National Universities Commission (2014) general study courses such as "Environment and Sustainable Development" in Nigerian universities are meant to allow students to have relevant knowledge outside of their respective fields of specialization, to make them well-rounded graduates.

A review of the course content for "Environment and Sustainable Development" in the Air Force Institute of Technology Kaduna shows that the topics being taught provide sufficient basic knowledge on sustainability to all undergraduates. In addition, all the engineering disciplines have faculty courses (e.g. Fluid Mechanics) that incorporate elements of sustainability into some of their courses and in addition, a few have departmental courses (e.g. Environmental Engineering). However, Akeel et al. (2018) observed that the current curriculum of engineering operated in Nigeria has relatively fewer sustainability-related topics compared to the curriculum used in higher education institutions in developed nations. Developing higher education curriculum is a long-term process with myriads of challenges (Lozano-Ro, 2013; Yan, 2015; Pennell, 2021), hence while HEIs in many developed nations have had a good head start (Alam, 2018; Alsharif, 2020), In Nigeria much is yet to be achieved in the way of adequate infusion of relevant topics in existing engineering curricula by stakeholders, namely; HEIs educators, curriculum developers and professional bodies such as the Council for the Regulation of Engineering in Nigeria (Akeel, 2018).

Some of the departments in the Faculty of Social and Management Science at the school offer courses that focus on globalization. The results of the survey show that all the undergraduates are being exposed to sustainability-related topics at the school. In Yan's (2015) study of sustainability education in Hong Kong, it was observed the inclusion of sustainability courses as general courses, has largely provided students with the opportunity to have sustainability knowledge irrespective of their discipline of study.

One of the features of education for sustainable development is the ''integration of existing and fragmented approaches to environmental education and Education for Sustainable Development into a holistic program'' (Woods 2004, cited in Tilbury, 2004: 104), where its multidisciplinary nature is glaring (Tilbury, 2004). Expectedly, universities are integrating sustainability into the curriculum of disciplines that hitherto had no elements of it. In this study, the outcome of the response to the item; ''Indicates the extent to which sustainability is a focus woven into traditional disciplinary education in science, math, literature, history, the arts, etc'', about 80% of the respondents stated that sustainability is being integrated into several disciplinary education as their responses were; ''a little'', ''quite a bit'' and ''a great deal''. A relatively small proportion (10.6%) of the respondent's answers were; '' I don't know'' and ''none''. This small proportion most likely belongs to the group that has only been exposed to sustainability-related topics when they offered ''Environment and Sustainable Development'' as a general study course and have had no additional teaching on sustainability-related topics.

Table 3: Sustainability-Related Curriculum in the Air Force Institute of Technology

	Responses					
	I Don't Know (%)	None (%)	A little (%)	Quite a bit (%)	A great deal (%)	Total (%)
Indicate the extent to which the school offers courses which address topics related to sustainability	-	-	24.1	40.4	35.5	100.0
The extent to which sustainability is a focus woven into traditional disciplinary education in science, math etc	6.4	4.2	30.5	28.4	30.5	100.0

3.3. Research and scholarship in sustainability

Higher education institutions are centres of research, and many studies (enson et al., 2007; Stephens & Graham, 2010; Alam, 2018) have shown that the transition to a sustainable society is only possible when sustainability-related research is conducted. In the Air Force Institute of Technology, about two-thirds (67.4%) of the student respondents would like to do sustainability-related research or be associated with scholarly activities that promote sustainability. The remaining respondents (32.6%) are not interested in conducting sustainability-related research (see Figure 1). For an institution that teaches ''Environment and Sustainable Development'' as a general course and sustainability-related topics at faculty and departmental levels, the impact of what is being taught on the students is significant. However, much more could still be achieved if the school has a multidisciplinary structure (centre) that is wholly committed to promoting research on sustainability. The creation of such centres in the school would have helped to add a practical edge to the teaching of sustainability and attract grants, which would boost funds available for research endeavours. In Yan (2015), it was observed that higher education institutions in Finland have very clear objectives for

sustainability research and research groups promoting sustainability-related work; alongside the creation of research centres for sustainability. This positively impacted the number of sustainability-related research being carried out in the higher education institutions in Finland.

The Faculty of Science at the Air Force Institute of Technology Kaduna has conducted several seminars, a few of which have a sustainability-related theme. The first conference organized by the faculty in 2022 was in line with the International Year of Basic Sciences for Sustainable Development; which goes to further increase multidisciplinary partnerships and collaboration with organisations and other higher education institutions. This effort has increased the literature available on sustainability and provided findings that help in tackling sustainability challenges in society. The conference reached more audience than lectures would have accomplished, thus helping the school to increase awareness of sustainability to a much bigger community of people. The observation made by Yan (2015) is that many higher education institutions in Hong Kong where sustainability is being taught, also engage in a wide range of sustainability events, such as seminars, exhibitions, workshops and conferences. These events are designed to bring much awareness and needed solutions to sustainability challenges.

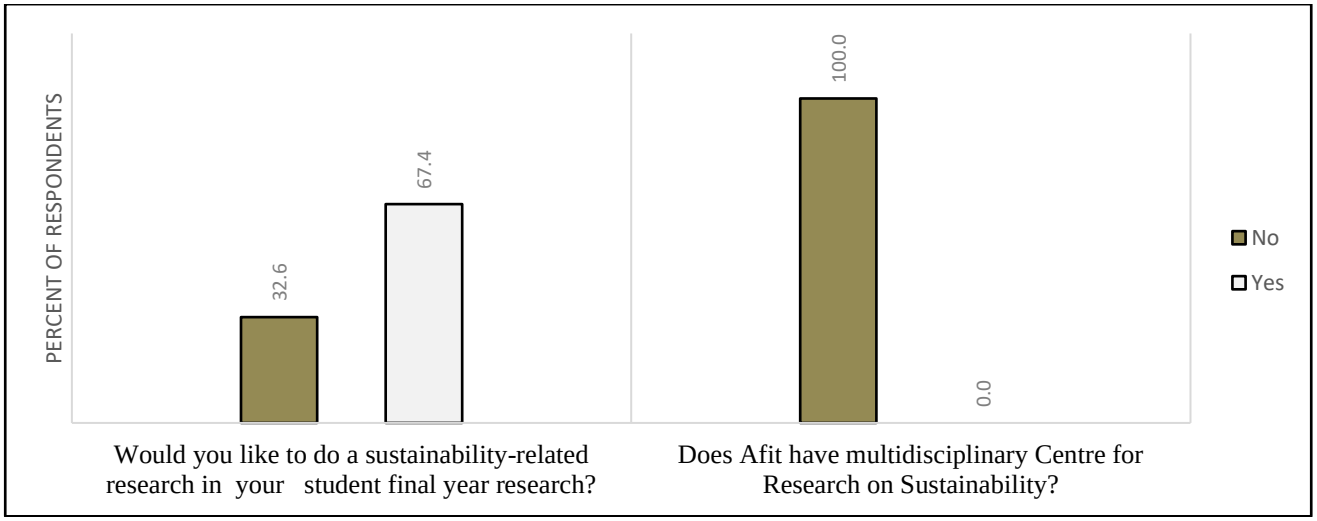

Figure 1: Sustainability-Related Research in AFIT

3.4. Operations and Practices of Sustainability

More than half (60%) of the staff who participated in the survey indicated that there is the incorporation of energy conservation practices in the school, as their responses were ‘’a little’’ and ‘’a great deal’’. The remaining respondents (40%) consider energy conservation to be ‘‘none’’ and ‘’I don’t know’’ (see Table 4). Many buildings in the school have large windows to promote good ventilation, thereby reducing the demand for cooling using air conditioners, which consume a lot of energy. This feature is common in the new construction being put up in the school. In addition, solar energy is increasingly being used as an alternative source of energy in school. The streetlights used around students' hostels and some sections of the faculty buildings are solely dependent on solar energy. In addition, on occasions where there is a power outage rather than run generators which are powered by fossil fuels, some of the large buildings (e.g. Information Communication Technology [ICT] centre and the school library) in the school turn to use solar energy. While there is no record to show the total solar energy produced, the school is situated in the tropics and hence can develop more capacity for solar energy use to promote energy efficiency that is less dependent on fossil fuels. To increase solar energy use, the school management went into an agreement with the Federal Ministry of Power and Energy through its Renewable Energy Agency (REA) to deploy a solar system with a capacity of 2 megawatts to the institution (AFIT, 2022). This initiative is all the more important as Nigeria’s national grid collapsed seven times between January and September 2022, which led to a great period of darkness in the country (AIT News at Four, 2022).

The lighting fixtures in the school use mostly a light-emitting diode (LED) system, which is energy efficient and promotes energy conservation in the school. The school is located in a tropical area, which is characterized by a wet and dry season. December and January are usually cool, but buildings within the school do not have heating systems that would have increased their energy consumption as the low temperature is not the same as found in cool or cold temperate regions of the world. Most of the buildings have good ventilation, thus reducing the need for continuous use of the air-cooling systems which are known to be a large energy consumer.

Waste reduction practices through the use of e-communications and double-sided copying are practised in the school. One-fifth (20%) of the respondents attested to the fact that there is a reduction in solid waste, howbeit, ‘a

little'; as much communication is known to be done electronically, which reduces the need for paper documents in the school. This method has been adopted because of the advantage of high accessibility for both staff and students and reduces the incidence of people not being able to access written documents. E-communication has not eradicated paper documents, as some documents are still circulated on paper. In addition, the use of computer-based testing and examination (CBTE) for some of the courses has largely reduced the paper being used and consequently cut down on the waste produced through paper-based examinations. A greater proportion of the respondents (60%) opined that no waste reduction has been observed, and one-fifth (20%) chose the option. '' I don't know'' (see Table 4).

The other way waste has been reduced is through reused paper, by printing non-sensitive information on the double side of the paper that already has printing on one side. This practice is not widespread and is largely to reduce expenses as some who practice it are administrative staff, who are not knowledgeable on sustainability concepts. Plastic waste in the school is being taken off by some staff who collect plastics bottles for reuse in the selling of local drinks (e.g. zobo and kunu), hence the final waste collected by the waste management team does not have much plastic bottle component, however, other forms of plastic could still be seen in the waste stream.

Recycling of solid waste in the school is very minimal as shown in Table 4; only 20% of the respondents opined that it is ''a little'' while more than half of the respondents (60%) opined that no recycling is taking place and 20% chose the option, ''I don't know'' (see Table 5). There are no recycling plants for waste generated in the school. The area where some form of recycling is carried out in the school is in the metal and carpentry workshops where furniture that is bad and would have been thrown away as waste is recycled.

In the study, the highest proportion of respondents (60%) opined that there is no water conservation, while 40% chose the option 'a little' (see Table 4). The toilets used in the school are regular toilet that does full flushing for every use, and there are no harvested rainwater systems. The availability of water all year round from the pipe-borne water system and boreholes in the school has not encouraged water conservation practices on a large scale. The area where water conservation is being practised is in the minimal use of water for irrigation. The lawns are largely rain-fed, and very minimal irrigation is carried out in the dry season. A dissimilar outcome was observed in Alam's (2018) study of sustainability in some higher education institutions in the United States of America, where it was revealed that higher education institutions located in areas of water stress have made significant efforts on water reductions (in some cases achieving more than 20% reduction) and expanded recycled water infrastructure. The contrasting findings made in the case study and the ones made by Alam (2018) show the connection between water availability and the effort made to reduce water use, as the perception of good water availability in the school discourages water conservation practices.

The responses to the questionnaire item on sustainable landscaping (emphasizing minimizing lawn) show a considerable level of sustainability, as all (100%) of the respondents took the options "a little'' and ''quite a bit''. Landscaping in the school has in recent times not been provided around new buildings being constructed unlike what was the norm in the past, where lawns formed part of the building plans. This action of not increasing areas covered by lawns in the school promotes sustainable landscaping as it would not increase the demand for water to keep the lawns green during the dry season.

A great proportion (80%) of the respondents felt sustainable transportation is being practised (see Table 4). The use of bicycles by students is on a steady increase. It is common to see staff members carpooling and the school management operates a bus program for staff members. All of these promote sustainable transportation programs in the school. In addition, there are a few all-electric tricycles for intra-varsity use that cut down emission levels in the school. This finding corroborates the outcome of Koc's (2014) study, where an increase in the adoption of sustainable transport was observed in HEIs.

In Yan's (2015) comparative study of higher education institutions in Hong Kong and Finland, and Alam's (2018) study of sustainability in higher education institutions in the United States; it was observed that several higher education institutions in their quest to promote sustainability have established sustainability committees and positions in the higher education institutions to help strategize and drive long term support for sustainable development. In this study, it was revealed through the responses provided that the school does not have significant standing committees addressing sustainability matters, however, the school as the need arises sets up ad-hoc committees that address some environmental concerns, such as water management in hostels and cleanliness of the living spaces in the school. Sustainability-related positions such as Dean of Environmental Programs Director of Sustainability Programs, Energy Officer or Green Purchasing Coordinator are not provided for in the school. What exists is a staff sergeant major (SSM), who acts as the environmental officer in the school, in charge of cleaning and lawn management in the school.

Table 4: Operation and practices of sustainability at the Air Force Institute of Technology

Practices	I don't know (%)	None (%)	A little (%)	Quite a bit (%)	A great deal (%)	Total (100%)
Energy conservation practices (including lighting, heating, cooling, ventilation etc.)	20	20	40	-	20	100
Waste reduction practices (such as e-communications, double-sided copying, programs, etc.)	40	20	40	-	-	100
Recycling of solid waste (including paper, plastic, metal etc.)	20	60	20	-	-	100
Water conservation practices (including efficient toilets, minimal irrigation, harvested rainwater, etc.)	-	60	40	-	-	100
Sustainable landscaping (emphasizing minimizing lawn, etc.)	-	-	80	20	-	100
Sustainable transportation program (including bicycles, carpools, bus pass programs, biodiesel projects, etc.)	-	20	60	20	-	100

3.5. Challenges of sustainability

Lack of funds was seen by all (100%) of the staff respondents as a factor that hinders the integration of sustainability initiatives into the operations and practices of the school (see Figure 3). The school is fully funded by the federal government and with dwindling budgetary allocations made to the education sector in recent times (Olufemi, 2020; Ekugbe, 2022) commitments to some of the infrastructure like renewable energy use and wastewater recycling would be very minimal at best; as is the case even in some high-income nations like the USA as observed by Koc (2014). A similar challenge of funding was revealed by Alam (2018) and Pennell (2021), where integration of sustainability has been impacted negatively in higher education institutions despite the diverse funding sources. Alsharif et al. (2020) have observed that greater funding is essential for sustainability operations and practices in higher education institutions.

The lack of a sustainability policy stating a formal commitment by the school to sustainability was seen by all the respondents as a factor that inhibits the incorporation of sustainability in the school (see Figure 3). The creation of specific positions and offices to help drive sustainability in the school was identified as a factor that hinders sustainability. Similar findings were made in the study of Saudi Arabia, where Alsharif et al. (2020) observed that the absence of sustainability-related policy and the concept of sustainability has not yet been formally adopted in public institutions. In nations where sustainability-related policies are in existence as observed by Boren et al. (2010), in the study of the Big Ten higher education institutions in the United States, the implementation of the policies has led to the HEIs making significant progress in integrating sustainability in the areas of administration, buildings, energy, transportation and recycling.

Studies show that higher education institutions that have made significant progress in the integration of sustainability are also those that have designated offices, positions and committees which are established to promote sustainability (Yan, 2015; Boren et al., 2010). Pennell (2021) opined that HEIs ''that explicitly link their sustainability office with their curriculum can provide valuable experiential learning opportunities for their students'' (p.83). In the case study, there are no designated offices or positions that are specifically created to promote sustainability. Forty percent (40%) of the staff respondents see this challenge as one factor that hampers the coordination of sustainability-related efforts (see Figure 3).

There is insufficient collaboration with other higher education institutions and relevant agencies on sustainability-related projects and research. One-fifth (20%) of the staff respondents opined that insufficient collaboration is a challenge. A similar observation was made by Yan (2015) where external collaborations in the research were identified as one of the challenges to the sustainability of higher education institutions in Hong Kong.

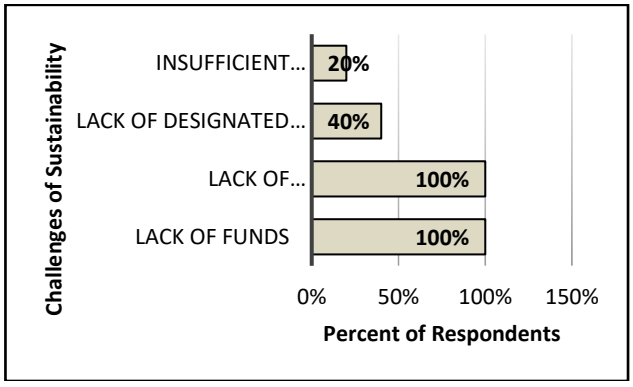

Figure 3: Challenges of Sustainability in AFIT

4. Conclusion

From the study, the following conclusions have been reached:

AFIT's curriculum provides all undergraduates with basic knowledge of sustainability-related topics through its general study course. Some sustainability-related topics are taught at faculty and departmental levels, creating much awareness among the student population and fulfilling the primary goal of the United Nations Decade of Education for Sustainable Development (DESD).

Most undergraduates are willing to conduct sustainability-related research. However, the absence of a multidisciplinary center for sustainability-related research could have deterred some who are not inclined toward sustainability-related research or scholarly activities.

While conservation of energy and water is practiced (through the use of solar energy and minimal irrigation), there are other areas of conservation not addressed on the campus. Greater water conservation could be achieved with a change in the toilet system, adoption of rainwater harvesting, and wastewater treatment plants. The common use of e-communication, double-copying, and the adoption of the CBTE exam have reduced waste to some extent in the HEI.

Gains made from sustainability operations are limited, as the institution does not have designated offices or positions for sustainability, as found in sustainable campuses in developed nations. The major factors hindering the integration of sustainability in AFIT are the absence of a formal sustainability-related policy and the lack of funds.

For significant progress to be made in the integration of sustainability, the following recommendations are made:

There is a need for AFIT to have a policy that promotes and guides sustainability-related initiatives. Offices and positions specifically for sustainability should be established. Greater multidisciplinary collaboration should be undertaken with other HEIs and relevant agencies. As a public HEI funded by the federal government, private citizens could be encouraged to set up endowment funds for sustainability-related projects in the school.

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