

ANALYSIS OF THE BENEFITS AND CHALLENGES FACED IN SKILL ACQUISITION IN THE UTILIZATION OF GREEN ENERGY IN THE CLOTHING AND TEXTILES LABORATORY IN TERTIARY INSTITUTIONS IN LAGOS STATE.

BY

¹OWODIONG-IDEMEKO, B.M (PhD), ²ADUBLI, K.O (PhD) & ³UDOM OWODIONG

¹Lagos State University of Education, Oto/Ijanikin

²Federal University of Agriculture, Abeokuta

³Bayshore School, Lekki, Lagos

Abstract

The study on the benefits and challenges faced in skill acquisition in the utilization of green energy in the clothing and textiles laboratory was conducted in three tertiary institutions offering clothing and textile in Lagos State. It sought to find out clothing and textile laboratory equipment for skill acquisition that require green energy due to erratic power supply, benefits and challenges and how staff and students can reduce carbon emission. A survey design was adopted for the study using a questionnaire containing 29 items. Data obtained was analyzed using frequency count, and percentage. The result shows that 150 (60%) indicated that fumes from generators was dangerous to health, 220 (88%) indicated that, green energy is cleaner, 205 (82%) indicated that, maintainance of green energy is low. 220 (88%) indicated that their energy supply is stable, 205 (82%) indicated that they reduce global warming, 215 (86%) indicate that initial cost of manufacturing is unaffordable. 235 (94%) indicated disposing them might emit pollution. 235 (94%) indicated that green energy site needs a lot of space. In conclusion, green energy is cleaner than use of generator. It is recommended that solar panels be installed by school authorities, bio-degradable packaging and natural fabrics be used during practicals by staff and students in the clothing laboratory.

Keywords: clothing and textiles, equipments, green energy, laboratory, staff, students.

Background of the study

Clothing and textile is a major branch of Home Economics that teaches students skills to be self-reliant. These skills are taught in the clothing and textile laboratories which are practical studios for learning and understanding of theoretical concepts (Ali 2021). The course covers skills such as pattern drafting, pattern illustration, textile design, fashion designing, accessory making, interior decoration, laundry, and crocheting, knitting etcetera. These skills are run by

machines electrically or electronically operated. They include sewing machines, embroidery, over locking, knitting, leather, quilting, industrial computerized sewing machines, iron, washing machine, projector, document camera and laptop. Tirey (2014), Aguire (2021), Godlewski (2020) observed computers and their softwares for taking of measurements, body scanners, virtual fashion shows, virtual reality (VR) and Augmented Reality (AR). Dowd (2020), Mohid (2021), Kiron (2021) noted there is a

document camera used in combination with interactive white board (IWB) for fashion designing, pattern making, textile illustration. (Kazlacheva, Stoykova, Georgieva, Ilieva 2018). Most are operated with the use of electricity which is never regular. Ohajianya, Abumere, Owate, Osarolube (2014) noted that, the erratic power supply in Lagos State is generally believed to be the bane of economic and industrial, educational development in the state. These factors include government's inconsistent and misguided power reform policies, inefficiency in power generation, transmission, distribution and consumption, and the incompetent work force of the energy companies. As a result Lagosians have sort for alternative power generation which comes at a huge cost. Such as solar energy, while some use petrol and deisel power generation. These generators emit fumes into the atmosphere which are dangerous to health. There is need to shift to green energy because it will lessen the burden on the environment.

The cost of installing renewable energy source can be expensive but after installation, it definitely decreases the cost of production. Uduma and Arciszewski (2010) opined that since "green" energy is clean energy that unlike fossil fuels it is non-polluting, that means it comes from 100% renewable sources. Their maintenance requirements are lower. (Chukwuebuka, Christain, Charles,

Ibekwe, Nzewkwe 2021). This translate to fewer maintenance, to more time and money saved, it can be collected in multiple locations simultaneously (Gaille, 2018). The reason why non-renewable energies tend to be cheaper today is because it is a commodity, unlike oil, petroleum, gasoline, natual gas (Hossein, 2021; Maradin, 2021). It provides job for local community. There is also stable cost of electricity (Lamb, Wiedman, Poncratz, Andrew, Crippa, Oliver, Khourdaje, 2021) and global warming is reduced. (Mcfarland, 2017).

However, there are challenges faced in utilizing green energy. Hossein (2021), Maradin (2021), Lawrence (2016) opined that, clean energy is renewable but not available 24 hours a day 7 days a week. The wind may blow on one day but may not on otherdays. When the weather is bad, renewable energy technologies such as solar cells will be of less use especially when it rains. The PV panels will not generate electricity as a result of one will get back to the traditional power sources. (Cassia, Norinoni, Correa – Aragunde, Lorenzo, 2018). The efficiency of renewable technologies is low as compared with traditional energy conversion devices. The initial cost of renewable energy is high and sometimes unaffordable. Fabbrocino(2021). Hossein (2021), McFarland (2017) noted that, renewable energy sites require a lot of space, their devices need recycling. While the disposal process might emit pollution,

they also need to be subsidized as it is difficult to assess by many people.

Liquori (2021) opined that, clothing should be designed using sustainable fabrics like hemp, organic cotton and pima cotton that have a negative impact on the environment, Agbonkhese and Aganbi (2016) observed that reuse or recycle fabrics should be used during practical to reduce pressure on carbon emission from the factories. Webb (2020). Liquori (2021) opined that fabrics to be used should be bought locally because the buyer avoids the heavy carbon emission or overseas shipping since they are locally bought. Cho (2021) observed that waste should be eliminated in the cutting room by eliminating the 15% of fabric that usually ends up on the cutting room floor in the making of a garment. Zero waste pattern cutting should be used. The use of 3D virtual sampling, printing and dressing can be used to work out details digitally before production. Artificial intelligence can be used to analyze products images from Instagram and weibo to predict trends and future demands in fashion. Mobile body scan to produce garments for variety of body sizes. (Kiron, 2020; Mohid, 2020). When dyeing fabric waste carbon dioxide (CO₂) should be used. Kazlacheva, Stoykova, Georgieva, Ilieva, (2018) noted that Dyeing techniques have been developed using waste carbon dioxide (CO₂) in place of water and chemicals. As it produces no waste and the garment comes out dry. Agbonkhese

and Aganbi (2016) noted that the watchword should be reduce waste, reuse what you can and recycle what you cannot because eco-friendly fashion is about using socially responsible manufacturing techniques that support community empowerment and social transformation. When packaging assignments for submission, biodegradable packaging should be used. Like cardboard or paper as well as bio-base plastics. Dawn (2019) noted that they are eco friendly, non toxic, cost effective, reusable and recycled. (Nicasio 2021) as well as using green energy. (Uduma and Archiszewski 2010). The environment is made safer and cleaner as a result.

Statement of the Problem

The erratic power supply in Lagos State is generally believed to be the bane of economic, industrial and educational development in Lagos State which includes government's inconsistent and misguided power reform policies, inefficiency in power generation, transmission, distribution, and consumption and the incompetent workforce of the energy companies. (Ohajianya, Abumers, Owate, Osarolube 2014). This has resulted in a large number of Lagosians opting for the use of generators, which comes at a huge cost. The constant use of generators emit fumes into the atmosphere resulting in air pollution which affects climate change and human health. This environmental

damage has resulted in agricultural job losses, the ripple effects are countless. These has prompted the people to look elsewhere for cleaner energy.

Objectives

The main purpose of the paper was to access the benefits and challenges faced in skill acquisition in the utilization of green energy in the clothing and textile laboratories in tertiary institutions in Lagos State. The study sought to:

1. Determine clothing and textile laboratory equipments for skill acquisition that require green energy in tertiary institutions in Lagos State.
2. Determine the benefits of green energy utilization in the clothing and textile laboratories in the study area.
3. Determine the challenges faced in the utilization of green energy in the clothing and textile laboratories in the study area.
4. Determine how staff and students of clothing and textiles can reduce carbon emission in the clothing and textile laboratories in the study area

Research Questions

1. What are the clothing and textile laboratory equipments that require green energy during practicals?
2. What are the benefits of utilizing green energy in the clothing and textile laboratory during practicals?
3. What are the challenges faced in the utilization of green energy in the

clothing and textile laboratory during practicals?

4. Can staff and students reduce carbon emissions in the clothing and textile laboratory during practicals?

Methodology

The descriptive survey design was adopted for the study. The areas of the study were three tertiary institutions in Lagos state offering clothing and textiles. These were Lagos State University of Education Oto/Ijanikin in Oto-Awori Local Council Development Authority (LCDA) Yaba College of Technology and University Of Lagos, all in Yaba Local government Area of Lagos State. The population of the study consisted of the Home Economics and Fashion Designing students since both offers clothing and textiles as a major course in all the institutions used they were 240 students and 10 lecturers, totaling 250 in number. Lagos state university, 54 respondents, Yaba College of technology, 83 respondents, University of Lagos, 113 respondents. A purposive sampling method was adopted for the study because the subject fit the profile of the people the researcher wanted to meet. A structured questionnaire was the main instrument used in the collection of data for the research, in which respondents were either to agree or disagree. the questionnaire was divided into two sections, section A and B. Section A was on the bio-data of the respondents, while section B had 29 items, 6 were on clothing

and textile laboratory equipment that needs green energy due to erratic power supply, 6 on benefits of utilizing green energy as a source of electricity, 8 on challenges in utilization of green energy and 9 ways of reducing carbon emission by staff and students in the clothing and textile laboratory totaling 29 items. The questionnaire was given content and face validity by 3 Home Economics lecturers, one each from the tertiary institutions

used. Reliability of the Instrument: the test re- test reliability test was used by the researcher by administering the same instrument to 10 respondents from each tertiary institution personally with the help of their lecturers who were the research assistants on an agreed date. All the questionnaires were collected. Data collected was analyzed using frequency counts, percentages. The results are presented below.

Research Question 1: What are the clothing and textile laboratory equipment that needs green energy due to erratic power supply?

Table 1: Clothing and textile laboratory equipment that needs green energy

S/N	Statement	Agree		Disagree	
		Freq.	%	Freq.	%
1	All sewing machines in the clothing and textile laboratory uses electricity	250	100	0	0
2	During laundry class the laundry machine needs electricity	220	88	30	12
3	Without electricity clothes can not be ironed during practicals	250	100	0	0
4	The laptop used by staff and students to keep abreast of trends in clothing and textile class is powered by electricity	248	99	2	1
5	Virtual fashion shows can not be watched without electricity on the laptop	234	94	15	6
6	The projector used to project practical skills during practicals needs electricity to function	202	81	48	19

Research Question 2: What are the benefits of utilizing green energy in the clothing and textile laboratory?

S/N	Statement	Agree		Disagree		Decision
		Freq.	%	Freq.	%	
1	Their maintenance requirement is low	205	82	45	18	Agreed
2	They can be used in multiple locations at the same time	220	88	30	12	Agreed
3	Their usage is cheaper than hydro-electric power	250	100	0	0	Agreed
4	Electricity supply from green energy is constant	220	88	30	12	Agreed
5	The energy supply is economical	220	88	30	12	Agreed
6	Global warming is reduced	205	82	45	18	Agreed

Table 2: Benefits of utilizing green energy

Research Question 3: What are the challenges in the utilization of green energy in the clothing and textile laboratory?

Table 3: Challenges in the utilization of green energy

S/N	Statement	Agree		Disagree		Decision
		Freq.	%	Freq.	%	
1	Initial cost of manufacturing green energy is unaffordable	215	86	35	14	Agreed
2	Green energy site needs a lot of space compared to traditional electricity station	235	94	14	6	Agreed
3	Manufacturing and disposing them might emit pollution	235	94	15	6	Agreed
4	The carbon they emit can result in deforestation	140	56	110	44	Agreed
5	These natural forces can change	220	88	30	12	Agreed
6	Therefore, it means that they are not so clean after all	175	70	75	30	Agreed
7	They need to be recycled	235	94	15	6	Agreed
8	Its production can be stopped or manipulated by the political class	175	70	75	30	Agreed

Research Question 4: Can staff and students reduce carbon emission with their choice of materials used during practical in the clothing and textile laboratory?

Table 4: Reduction of carbon emission by staff and students in the clothing laboratory

S/N	Statement	Agree		Disagree		Decision
		Freq.	%	Freq.	%	
1	Natural fabrics should be used in garment construction	215	86	35	14	Agreed
2	Reuse or recycle fabrics should be used	190	76	60	4	Agreed
3	Waste should be eliminated when cutting fabrics	235	94	15	6	Agreed
4	Waste should be eliminated when cutting patterns	220	88	30	2	Agreed
5	Technologies should be employed during practical	205	82	45	18	Agreed
6	Left over pieces of fabrics can be used to create new garments	235	94	15	6	Agreed
7	Fabrics can be sampled virtually using 3D software	205	82	45	18	Agreed
8	Cardboard or paper should be used in submitting assignment	170	68	80	32	Agreed
9	This is because they are eco-friendly	220	88	30	12	Agreed

Discussion of Findings

Table 1 reveals that out of 250 respondents 100% of the respondents agreed that all sewing machines in the clothing laboratory use electricity. (Aguire, 2021) 220 (88%) agreed during laundry class the laundry machine needs electricity.

(Godlewski, 2020) 250 (100%) agreed that without electricity clothes can not be ironed during practicals. (Tirey, 2014) 248 (99%) agreed that laptops used by staff and students in class for trends in clothing and textiles need electricity. (Kiron, 2021) 234 (94%) agreed that

virtual fashion shows can not be watched without electricity. (Kazlacheva Stoykova, Georgieva, Ilieva, 2018) 208 (81%) agreed that the projector used to project practical skill needs electricity (Dowd, 2020; Mohid, 2021)

Table 2 reveal that, out of 250 respondents. 205(82%)agreed that their maintenance requirement is low, (Chukwebuka, Christian, Charles, Ibekwe, Nzekwe, 2021) 220 (88%) agreed that renewable energy can be used in multiple locations at the same time. (Fabricino, 2021; Gaille, 2018) 250(100%) agreed that their usage is cheaper than hydro electric power, (Webb, 2020;Maradin, 2021; Lawrence, 2016) 220 (88%) agreed that electricity supply from green energy is constant. (Lamb, Wiedman, Pongratz, Andrew, Crippa, Oliver, Khourdaje, House, 2021) 220(88%) agreed that the cost of their energy supply is economical. (Hossein 2021). (Lamb, Weidmann, Pongratz, Andrew, Crippa, Oliver, Khourdaje House 2021; Uduma and Arciszewski 2010; Hossein, 2021) 205(82%) agreed that global warming is reduced, (Mcfarland , 2017; Lawrence, 2016; Maradin, 2021)

Table 3 reveal that out of 250 respondents, 215 (86%) agreed that the initial cost of manufacturing green energy is unaffordable. (Cassia, Nocinomi, Correa-Aragunde, Lorenzo 2018) 235 (95%) agreed that green energy site needs

a lot of space compared to traditional electricity station. (Fabbrocini, 2021; Gaille, 2018; Hossein, 2021; McFarland, 2017). 235 (94%) agreed that manufacturing and disposing them might emit pollution. (Lamb, Wiedmann, Pongratz, Andrew, Crippa, Oliver, Khourdaje, House 2021). 140 (56%) agreed that the carbon they emit can result in deforestation. (Lamb, Wiedmann, Pongratz, Andrew, Crippa, Oliver, Khourdaje, House, 2021).220 (88%) agreed that the natural forces can change, (Hossein, 2021;Lawrence, 2016; Maradin, 2021). 175 (70%) agreed that they are not so clean. (Fabbrocino, 2021; Gaille, 2018; Hossein, 2021; Mcfarland, 2017). 235 (94%) agreed that they need to be recycled. (McFarland, 2017; Maradin, 2021; Lawrence, 2016). 175 (70%) agreed that production can be stopped or manipulated by the political class. (Lamb, Wiedman, Pongratz, Andrew, Crippa, Oliver, Khourdaje, House 2021).

Table 4 reveals that, out of 250 respondents, 215 (86%) agreed that natural fabrics should be used in garment construction. (Liquori, 2021), 190 (96%) agreed that reused or recycled fabrics should be used. (Agbonkhese and Aganbi 2016). 235 (94%) agreed that waste should be eliminated when cutting fabrics. (Cho, 2021). 220 (88%) agreed that waste should be eliminated when cutting patterns. (Kiron, 2020; Mohid, 2020; Kazlacheva, Stoykova, Georgieva, Ilieva 2018) 235 (94%) agreed that

leftover pieces of fabrics can be used to create new garments. (Cho, 2021; Agbonkhese and Aganbi 2016). 205 (82%) agreed that fabrics can be sampled virtually using 3D software. (Kiron, 2020; Mohid, 2020; Kazlacheva, Stoykova, Georgieva, Ilieva 2018). 170 (68%) agreed that cardboard or paper should be used in submitting assignment. (Dawn, 2019). 220 (88%) agreed that they are eco-friendly. (Dawn, 2019; Nicasio, 2021).

Conclusion

Clothing and textile practical are carried out in the laboratory and there are lots of equipment that needs to be powered constantly by electricity. But due to the erratic power supply, the skills in which the machine are meant for are often left unpracticed, thereby making school authorities to resort to the use of generators that are injurious to the health of both staff and students due to the fumes they emit. Hence, there is need to source for a cleaner energy. Although it has its advantages and disadvantages, but when the power supply from the power generation company is not adequate, then staff and students as well as the school authority can switch over to green energy. Reducing carbon emission can also be a priority in the clothing and textile laboratory with the choice of materials and activities chosen.

Recommendations

In view of the foregoing, the following recommendations were made to reduce carbon emission in the clothing and textile laboratory.

- Solar panel or wind farms should be installed by both State and Federal government to complement the erratic power supply for the use of clothing and textile equipment during practical.
- Provision of green energy by both federal and state government in tertiary institutions in Lagos state will help reduce global warming.
- To reduce challenges faced with the use of green energy they should be recycled by university authorities in order to produce lower levels of pollution.
- Natural fabrics and bio-degradable materials during practicals should be used by both staff and students during practicals to reduce carbon emission.

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