# Anglia Ruskin University

# Transformation towards Sustainable Living under Global Education Approach:  International Students' Experience

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**A thesis in partial fulfilment of the requirements of Anglia Ruskin University for the degree of doctor of philosophy (PhD) Business**

**Submitted May 2014**

# Acknowledgement

I am happy to express my gratitude and thanks to all those who have in one way or the other contributed to the fulfilment of my life dream of getting a PhD when all hopes seemed lost. The achievement of this objective confirms that age is no barrier to achieving ones goal. However, some people made it possible for me to land softly.

My special thanks go to my supervisors, present and past that devoted their time to reading and correcting several draft copies, some of which were unintelligible.  First in the list is Dr. Noah Kofi Karley, Dr. David Arkel, Dr Helen Benton, Dr Bronwen Rees, and Dr Katalin Illes all of who were my supervisors. I am ever grateful to all of you for your immeasurable contributions.

Also to receive kudos is Dr. Rob Willis and Dr Andrew Armitage both of who regularly organised research degree trainings that changed my research culture dramatically. I am also indebted to Dr Jonathan Wilson for teaching me research methods in a way it has never been taught before. All of you have made significant difference in my research experience. Equally appreciated is Dr Beatriz Acevedo for her priceless advice.

May I also thank the Ebonyi State Government of Nigeria, especially His Excellency the Governor of Ebonyi State, Chief Martin Nwanchor Elechi, the Special Adviser on Higher Education, Prof. Mikel Otuma, the Commissioner for Local Government and Chieftaincy Matters, Hon. Celestine Nwali and my father Mr Nwogbunku Elem for their candid supports.

Finally, I am grateful to my wife, Mrs Maria Elem and children for their support, my colleagues, Dr Odii Benedict, Prince Eze Ogbonia, Mr Opudo Abila and wife, Romas and Samer.

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## Abstract

This study is centred on transformation towards sustainable living. It investigated how global education prepares learners to live a sustainable lifestyle. To explore this area, the concept of sustainability, global education and transformative learning were critically examined, with a view to finding their relationships. Literature on sustainability, transformative learning and global education were reviewed to find out how their relationships impact on international students learning about sustainable living. The focus of the thesis is on environmental sustainability, especially through management of anthropogenic factors. The mixed methods research, involving the collection of quantitative and qualitative data was employed for the study. Quantitative data collection was done using survey instruments while qualitative data collection was through face-to-face interview of research participants. Each set of data was collected and analysed separately. The outcomes of the analysis of the two sets of data were integrated at the stage of discussion of findings. The aim of the study was to find out whether global education transforms learners towards sustainable living. Findings from the study showed that global education field transforms students towards sustainable living. Evidence from the study suggests that global education help students to acquire the skills and knowledge required for living sustainably. Also, the actions and behaviours of international students were found to be influenced more towards sustainable lifestyle than those from the host country. The degree of transformation students experience was measured by attitude change, intention to change and actions of students toward the environment. This study contributed to the conceptual understanding of the relationship between global education and transformation of learners towards sustainable living. It made both theoretical and practical contribution to knowledge. The findings from the study will be of benefit to different impact groups. These groups include business organisations, policy makers in government, educational institutions, and individuals.

*(Key Words: Global Education, Transformative Learning, Sustainability).*

# Table of Contents

## Chapter Four: Research Design: Methodology and Methods

## Chapter Five: Data Presentation and Analysis [Findings]

## Chapter Six: Discussion of Findings

## Chapter Seven: Contribution to knowledge, Conclusions and Recommendations

## List of Tables

## List of Figures

## List of Acronyms

AC: Abstract Conceptualisation

ADC: Asian Developing Countries

AE: Active Experimentation

AU: Active Use

CE: Concrete Experience:

CEO; Chief Executive of Organisation

$CO_2$: Carbon dioxide

$CO_2e$: Carbon dioxide equivalent

CRA: Critical Reflection of Assumption

Crosstab: Cross Tabulation

DCs: Developed Countries

DEFRA: Development for Environment, Food and Rural Affairs

EDET Group: Development Education Training Groups

EfSD: Education for Sustainable Development

ELT; Experiential Learning Theory

ESD: Education for Sustainable Development

EU: European Union

EV: Experiential Value

FDI: Foreign Direct Investment

FNBE: Finish National Board of Education

GE: Global Education

GHG: Green House Gases

GUNI: Global University Network for Innovation

HE: High Education

HEIs: Higher Education Institutions

ICPQL: Independent Commission on Population and Quality of Life

IPCC: Intergovernmental Panel on Climate Change

IUCN: International Union for Conservation of Nature

Kg: Kilogramme

Lao PDR: Lao People's Democratic Republic

LCDs: Less Developed Countries

Nox: Nitrogen Oxide

PESTLE: Political, Economic, Sociological, Technological, Legal and Environmental

PM: Particular Matter

PPM: Parts per Million

Respondent ID: Identification number assigned to each respondent for the purpose of analysis

RO: Reflective Observation

SD: Sustainable Development

Sox: Sulphur Oxide

SPSS: Statistical Package for Social Sciences

TL: Transformative Learning

UK; United Kingdom

UKCISA: United Kingdom Council for International Students Affairs

UNDP: United Nations Development Programme

UNCEP: United Nations Conference on Environment and Development

UNEP: United Nation's Environmental Programme

UNESCO: United Nation Educational, Scientific and Cultural Organisation

US: United States

WCED: World Commission on Environment and Development

WHO: World Health Organisation

WWF: World Wide Fund now called World Wide Fund for Nature

# Chapter One

# Raison d'être, Themes and Issues

## 1.1 Introduction

Education is perceived as the means of bettering the lives of people and improving the society at large. This understanding has led to increasing reliance on the power of education to solve human problems. With the development of global education, education became an instrument for transforming the lives of people at local and global levels. It helps to improve the lives of all people on earth by providing learners with the knowledge and skills for addressing global issues. Such issues include how to reduce the impacts of climate change, environmental degradation, poverty, social injustice and other manifestations of global inequality. These issues fall within the ambit of global education. Hence, this study is intended to investigate how global education helps to transform students to live by the principles of sustainability.

Global forms of education started to be a high priority in the early 21st century when as a result of economic recessions, educational institutions began to develop strategic alliances aimed at increasing international exchanges, collaboration research findings and students revenues (Baggaley, 2012). This development is crucial in an era when the world is increasingly getting broken. Many people today who care about the way the world is going believe that the current global system is seriously broken (e.g., Cavanagh *et al.,* 2002; Derber, 1998, 2002, 2004; Korten, 1995 cited in Stubbs, 2007) and that a transformation is required to make us begin shifting our uses of economic and other material resources, our communities and societies, and the natural environment toward a healthier and more sustainable world (Stubbs, 2007). But it could be difficult to begin the process of transformation in a vacuum. Thus, an approach to education that reflect global issues is required to serve as a platform for transforming people towards sustainable living. This approach already exists in different forms one of which is transformative global education (Selby, 2004). According to Merryfield's (1997 as cited in Lucas, 2010, p.212), global education is "the study of human beliefs and values, global systems, global issues and problems, global history, cross-cultural understanding/interaction, awareness of human choices, the development of analytical and evaluative skills, and strategies for participation

and involvement". Understood from this perspective, the introduction of global education approach is expected to help people share ideas and use the opportunity provided by the approach to influence changes, and help to transform people to live sustainably. In line with this thinking, Bliss (2010) explained that global education stresses the development of positive values and attitudes that lead people to respect the right and dignity of others and appreciate the implications of diversity and differences among people.

Global education also encourages and empowers learners to translate their knowledge, skills and values into a preparedness to participate actively in community life and at the same time it is vital that students develop a realistic awareness of how effective such action and participation will be (Bliss, 2010). These qualities of global education make it an important instrument for educating students towards sustainable living, particularly at this period when learning sustainable development is becoming central at all levels of education as a means of creating awareness of sustainability for maintaining and improving the quality of life in the present and future generation (Aziz, *et al.,* 2012). In the creation of this awareness and bringing about the transformation required to create a sustainable society, universities as institution that provide higher education become avenue that could be used to reform and develop the knowledge, skills and attitudes of students to live by the principles of sustainability, and provide solutions to the problems in society (Aziz, *et al.* 2012).

It is getting clearer on daily basis that the world is sliding into what looks like an irreversible environmental abyss. This situation is one of the major problems facing the world in the 21st century. Emphasising the enormity of the problem, Phillis and Andriantiatsaholiniiaina (2001) stated that as we enter the new millennium, one of the most challenging questions to be addressed is how to assess, build, and maintain a sustainable economy that will allow the human society to enjoy a sufficiently high standard of living without destroying its natural and biological support. Under this condition that humanity faces a world in which there is a high level of anthropogenic-induced environmental problems, with serious implications for the wellbeing of humans and other species on earth, there is need for university as an institution that has played significant roles in the transformation of society to contribute to addressing sustainability issues (Waas, Verbruggen and Wright, 2010). Addressing the issues of sustainability has become imperative because it is important to protect the present and future generations of people on earth from the adverse effects of climate change,

environmental pollution, and depletion of resources, desertification, acid rain, overpopulation and hunger. This should be the collective responsibility of everyone but "While all actors of society must contribute in the transition towards a sustainable world, universities are seen as a major catalyst to work towards this goal" (Waas, Verbruggen and Wright 2010, p.629).

On the other hand, it is widely believed that instead of higher education engaging students in learning that is transformative towards sustainable living, higher education institutions often engage in verifying that students have got rich stocks of college credits before issuing academic degrees (Glisczinski, 2007). They do this without assessing whether the college graduates can critically engage complex issues, relationships, problems and opportunities (Glisczinski, 2007). But based on the need of modern society, learners should in addition to acquiring stocks of knowledge and comprehension, be able to develop perspective, empathy and self-knowledge. These require learners to analyse information from different perspectives, explain other people's experiences, and act on this learning in their own lives (Wiggins and McTighe, 1998 as cited in Glisczinski, 2007). By implication, learning should not end at acquiring stocks of knowledge. The knowledge so acquired needs to be applied to solve human problems. In the current education system, how this transformation is being achieved needs to be understood.

However, studies show that the contributions of education towards making learners to live sustainably have been less investigated (e.g Cortese, 2003; Anderberg, Norden and Hansson, 2009). In the study carried out by Anderberg, Norden and Hansson (2009) on *Global Learning for Sustainable Development (GLSD) in Higher Education: recent trend and critique,* it was found that "only relatively limited steps have been implemented to achieve, GLSD and rhetoric still dominates the discussions. It appears that little empirical research has been undertaken on learning in global settings". In addition, Cortese (2003) stated that despite the efforts of many individuals and groups in the formal education system, education for a just and sustainable world is not a high priority. This could be because of the global desire for quick economic growth. This trend leads to the entrenchment of the form of education system that places priority on the production of goods for the global market place without giving enough attention to the environmental consequences of strategy. Now that global forms of education seem to be gradually becoming more popular, a research as this is relevant in order to find out whether there is transformation of learners towards sustainable

living under the global education field. Supporting the need for this research, the study by Gaudelli (2003 cited in Anderberg, Norden and Hansson, 2009) showed that, in spite of a very lively debate, very little is known about the effectiveness of how global learning for sustainable development develops students' learning.

In recognition that the role of education is important in resolving sustainability issues, Stephen and Graham (2010) stated that as within the past decades, the role of higher education in the context of an ongoing societal transition towards greater sustainability has emerged as a subject of significant scholarly attention. The developing research in this area can be seen from the several studies already undertaken in sustainability, and which have resulted in the emergence of varied literature (e.g. Magala 2012; Tilbury 1995; Philis, Grigoroudis and Kouikoglou, 2011; Moldan and Dahl, 2007; Hardings, 2006; Marshal and Toffel, 2005). Some of the studies carried out in this area described the relationship between knowledge and attitude towards sustainability (e.g. Shephard, 2008; and Segalas, Ferrer-Balas and Mulder, 2008) which pointed to the fact that graduates should know about sustainability issues, what they should know and that evidence show that students are educated towards these ends. Findings from some of these studies indicated that "Higher education (HE) and research institutions are contributing to sustainable development through investigations and, or through development of new methods and approaches in the interdisciplinary area" (Dlouha, Barton, Huisingh and Admossent, 2013, p.1).

Although the several and emerging literature on sustainability in higher education is varied, it is dominated by empirical and descriptive studies of specific approaches, strategies and initiatives at specific institutions, and also includes prescriptive studies that often call on universities to play a more prominent role in sustainability and sustainability education (Stephen and Graham, 2010). In addition, the actual changes in the behaviour of students as a result of the efforts higher education institutions are making have been rarely studied. The implication of this is that fewer studies have been carried out on transformation of students towards sustainable living. Thus, while studies on transformative learning and education for sustainable development abounds (e.g.Sterling, 2010; 2012; Sevenson and Hogevold, 2012; Stephens *et al.,* 2008; Rowe, 2007; Rusinko, 2009; Rees, 2003; Remigisjus, Algirdas, Nijole and Dalia, 2008; Moore, 2005. Mezirow, 1995; 1996; 1997; 2000; O'Sullivan, 1999, O'Sullivan and Taylor, 2004; McGregor, 2004), most of these studies discussed what

students should learn in terms of sustainability, but said little or nothing on what students actually know about sustainability (Carew and Mitchell, 2002 as cited in Kagawa, 2007), and made little or no connections between transformative learning and sustainable living. On the whole, they are few studies related to transformation towards sustainable living. Even fewer studies explored how the global education system transforms students to live sustainably.

In this study, Global Education field which encompasses Development education, global citizenship education, and sustainability education are examined to ascertain their impacts on the transformation of students at university with respect to their developing sustainable living lifestyle. To clarify meanings of terms used in this study, I now turn to define key concepts and terminologies as used in this study

## 1.2 Definition of Terms

Clear conceptual and operational definitions of the terms used in this study are provided in this section to guide our understanding of the contextual use. Eight concepts are conceptually and operationally defined. These concepts are sustainability, personal transformation, transformative experience, transformative learning, sustainable living, global education and formal and informal education.

**i. Sustainability:** A definition of sustainability that captured the interest of the researcher is that "a sustainable society possesses the ability to continue to survive and prosper both with respect to environmental resources and economic development and the quality of life as it pertains to conditions that promote overall economic growth and collective human prosperity (e.g., opportunity, economy, privacy, community, the arts, education, and health)" (Pappas , Pierrakos and Nagel 2013, p.55). Sustainability refers to the use of available economic resources to achieve economic development and satisfy human needs without exhausting the resources or compromising the ability of the future generation to satisfy their own needs.

In a sustainable society, economic and social needs have to be met simultaneously, and with regards to human aspect, the negotiation of differences that might arise in the process has to be done without violence (Pappas, 2012). The creation of a sustainable society therefore rests in the hands of those individuals and organisations that engage in economic and social

5

activities in their daily living. Hence, to pursue economic development, attention needs to be paid to the interconnections between economic development and sustainability issues.

In this study, sustainability is used with particular emphasis on how people live their lives in order to bequeath a healthy environment and economy to the next generations while not compromising the satisfaction of their own needs. The use of the term, sustainability, in this sense is important because it is the lifestyle of people both as individual actors and as policy makers or corporate bodies that are partly responsible for the growing rate of sustainability crises. Supporting this view, Raven (2002 as cited in McMichael and Folke) stated that accounting evidence exists that humankind is jeopardising its own longer term interest by living beyond the carrying capacity of the earth thereby changing atmospheric composition and reducing biodiversity, soil fertility, ocean fisheries and freshwater supplies. Carrying capacity in this context refers to the optimum population the available natural resources can effectively support in order to ensure a good standard of living for world population. The intensity of natural resource use affects the carrying capacity of the natural environment. Traditionally, carrying capacity is a term used to describe "the maximum population size that the environment can support on a continuing basis" (Brown, Hanson, Liverman and Merideth, Jr. n.d, P.714).

**ii. Personal Transformation:** Personal transformation involves an individual making change from the old ways of doing things to new ways of doing things in order to achieve better results. A transformed individual is a changed person. Such person develops new perspectives of seeing things. Transformation is viewed as evolutionary process within the consciousness which makes a person to see the world in a new way (Ferguson 1980; Stern, 1993 as cited in Wade, 1998). According to Wade (1998) individuals achieve a clearer and more expanded view of the world through transformation process. When transformation takes place in an individual, the consciousness of the person is opened to wider dimensions, making it possible for the mind to access information processed by the brain at an unconscious level (Wade, 1998). Ferguson (1980 as cited in Wade, 1998, p.68) defined personal transformation as "the state of being conscious of one's consciousness".

In this study, the term personal transformation refers to a change in the attitudes, behaviours and actions of an individual. These changes should be positive and compatible with social and economic values that help people either as a group or as individuals to avoid doing things

that could cause irreversible damage to the environment and, or jeopardise the chances of survival of the future generations.

**iii. Transformative Experience:** Pugh (2011, 107) defined transformative experience as a "learning episode in which a student acts on the subject matter by using it in everyday experience to more fully perceive some aspect of the world and finds meaning in doing so". The three elements highlighted in this definition which are considered important are (a) acting on an idea (which implies engaging with concepts as ideas), (b) experiencing an expansion of perception, and (c) developing a value for the content and the experience it affords (Pugh, 2011).

In this study, transformative experience is taken to mean the knowledge and skills students gain at university through learning and interaction with others and which helps to change the learners lifestyle from behaving and acting in unsustainable ways to behaving and acting in sustainable manners. In Pugh's (2011, p. 107) view, "Transformative experiences occur when students actively use curricular concepts in everyday life to see and experience the world in a new, meaningful way".

**iv. Transformative Learning:** In its simplest form, transformative learning is learning that takes the learners' knowledge and skills into a new domain that results in a change in the learners' cognitive and affective process (McEwen, Strachan and Lynch, 2010). Mezirow (2000, p.7) defined transformative learning as "…the process by which we transform our taken for-granted-frames of reference (meaning perspectives, habits of mind, mind sets) to make them more inclusive, discriminating, open, emotionally capable of change and reflective so that they may generate beliefs and opinions that will prove more true or justified to guide action". In this study, transformative learning is regarded as the learning that leads to a change in the attitudes and behaviours of the learner.

**v. Sustainable living:** Sustainable living refers to a lifestyle that takes care of the needs of the present and the future generations to come. With regard to production of goods and services and consumption pattern, sustainable living requires that the production of goods and the rendering of services are planned in such a way that they do not endanger human health and the environment. This implies that entity complying with sustainable living should be conscious of the impacts of its actions on the environment, and take into consideration some

measures that can help reduce environmental problems. An individual or organisation that is living or acting sustainably ought to be conscious of the implications of any actions that can lead to unsustainability, and thus take steps to avoid them. Goodman (2011, p.733) stated that "Sustainable living entails ensuring that current patterns of consumption and lifestyles do not endanger the physical base for coming generations". The need to ensure that the economic pillars and the ecology providing life-supports for the present generation subsist must also be recognised. Sustainable living exists if in the process of satisfying human needs, there is a planned system that harmonises both human and environmental ecologies through the use of the right technologies, cooperative economics, and individual resourcefulness (Joseph and Rouths, 2002).

In this study, sustainable living is used to mean how individuals and organisations relate to the environment, the ecosystem and the economy in order to balance today's needs with the need of future generations of people. Sustainability is thus, used in this study from the managerial and organisational perspective because nowadays, many firms and organisations are making efforts to implement something sustainable (Faber, Jorna, and Eneglen, 2005). This means that if individuals, companies and organisations want to do something about or with sustainability, they should know what sustainable means (Faber, Jorna, and Eneglen, 2005).

**vi. Global Education:** The Maastricht Global Education Declaration (2002) defined Global Education as "education that opens people's eyes and minds to the realities of the globalised world and awakens them to bring about a world of greater justice, equity and human rights for all". It further explained that Global education covers issues in Development Education, Human Rights Education, Education for Sustainability, Education for Peace and Conflict Prevention and Intercultural Education; [these] being the global dimension of Education for Citizenship. But these dimensions of global education have evolved different approaches. Lyons (1992 as cited in Selby, 1999) stated that global education seeks to promote the study of global issues and themes such as sustainable futures, quality of life and so, uses interdisciplinary or trans-disciplinary framework. It follows from the forgoing definition that education for sustainable development is a major component of global education. From the perspective of UNESCO (2013) world conference for education for sustainable development, global education and education for sustainable development have certain things in common. UNESCO (2013) pointed out that in education for sustainable development (ESD), such

issues as human rights, poverty reduction, sustainable livelihoods, climate change, gender equality, corporate social responsibility and protection of indigenous cultures are talked about in an integral way.

Global education as the name suggests can be simply called international education. It is international education in the sense that the issues covered in global education are key issues that affect all countries. Often, world conferences are held to address these issues. Supporting the view that global education is international education in the sense that it deals on issues affecting different countries across the globe, Tye (2003), drawing from the definition of global education as provided by Association for Supervision and Curriculum Development (ASCD, 1991) Yearbook stated that "Global education involves learning about those problems and issues which cut across national boundaries and about the interconnectedness of systems: cultural, ecological, economic, political, and technological". This definition captures the essence of global education. Thus, global education approach as used in this study refers to the teaching and learning that integrate global issues into formal education.

**vii: Formal education:** Formal education is the form of education practice that has well defined features. It "corresponds to a systematic, organised education model, structured and administered according to a given set of laws and norms, presenting a rather rigid curriculum as regards objectives, content and methodology" (Dib, 1988, p.1). Formal education is the type of education process usually adopted by our schools and universities. This form of education bring the teacher, the students and the institution together under one roof for teaching and learning.

**viii: Informal education:** Informal education differs from formal education in the sense that the education process that is informal "does not correspond to an organised and systematic view of education; informal education does not necessarily include the objective and subjects encompassed by the traditional curricula" (Dib, 1988, p.6). The author explained that informal education is aimed at students as much as the public at large and imposes no obligations whatsoever to their nature. Informal education does not of necessity regard the providing of degrees or diplomas; it serves as supplements to formal education (Dib, 1988).

The terms defined above are applied in this study with respect to environmental sustainability. They are used in this study to explain the relationship between global

education and transformation of learners towards sustainable living. Thus, in the literature reviewed, further explanations of the concepts are made and the connections between global education, transformative learning and sustainability are explained.

## 1.3 The Need for Education - Transformation - Sustainability Link

There are now more than enough evidences that indicate we are now living beyond the carrying capacity of the earth. Scholars from various disciplines have identified several evidences that suggest that humankind has exceeded the limit permitted by nature with regard to their dependence on natural resources. This action has resulted in various catastrophes. According to Ebohon and Rwelamila, 2000), the environmental consequences of undermining the earth's 'carrying capacity' are frequently witnessed and they result in huge catastrophes such as flooding and landslides, climate change and the extinction of many species of fauna and flora. These occurrences clearly show that humankind has not been living by the fundamental principles of environmental sustainability which requires that we should satisfy our present needs without jeopardising the opportunity of the future generations to satisfy their own needs (Ebohon and Rwelamila, 2000). By implication, we have failed to live within the limit permitted by nature for satisfying human wants, and this situation needs to be addressed to avoid further shortage of resources and damage to the environment and human health. Also, this could constrain global growth and development with implications for poverty alleviation. Clearly, the patterns of living of humankind do not harmonise socio-economic activities with the need to protect the environment and preserve the biodiversity that enable sustenance of life on earth (Vitousek, Mooney, Lubchenco and Melillo, 1997).

These unsustainable ways of living with all their attendant consequences require urgent redress in order to restore the hope of the present and future generations to inherit a safe planet. The need to urgently address the problem of unsustainable living was emphasised by Hardings (2006) when he pointed out that what is clear to all those involved in resolving sustainability problems is that the way in which we use resources and deal with waste products require urgent attention. In support of this view, Ebohon and Rwelamila, 2000) explained that the carrying capacity of the physical and biotic environment has come under considerable pressure and threats from the huge and insatiable needs of mankind for survival. This, according to the authors, is as a result of the increase in global population and the need

to match economic growth and development to reduce global poverty, the cost of which is disproportionately shared by developing countries.

Some of the causes of sustainability crisis have been attributed to economic development strategies and the ever changing lifestyle that have continued to put pressure on the limited natural resources. Thus, the problem is that the strategies and processes followed by individuals and nations to achieve economic growth and development have been resources intensive (Ebohon and Rwelamila, 2000). The implication of this approach to economic growth and development is that it results in depletion of natural resources, and environmental degradation, giving rise to sustainability crisis.  Environmental pollution, climate change, greenhouse gas emissions, and decrease in soil fertility among others are all the aftermath of the strategies and processes applied by humans in the pursuit of economic growth and development. If human activities are the cause of unsustainability, the solution to the problems could depend on changing the ways we use economic resources and how we relate to the environment.

In the search for a lasting solution to this critical problem, the university as a repository of knowledge and skills is considered by many as capable of bringing about the transformation of the lifestyles of people to live sustainably (e.g. Daloz, 1990; Chakley, 2006; Glisczinki, 2007; Sterling, 2011). In the move to utilise education as a means of creating a sustainable society, the Higher Education Funding Council for England (HEFCE) (2008) stated that it was committed to making its 2005 vision valid, that within the next 10 years, the higher education sector of England will be recognised as a major contributor to society's efforts to achieve sustainability. HEFCE (2008) stated that it will contribute to achieving sustainability through equipping its graduates with the skills and knowledge they need to put into practice, and through its own strategies and operations.

However, Sterling (2011) argued that western education cannot help in the efforts to making people live a sustainable lifestyle because of its mechanistic and utilitarian market philosophy. The author, therefore, suggested that ecological or whole system thinking be employed to critique the current education theory and practice in order to make it both transformative and transcended. Sterling (2011) stressed the increasing efforts toward creating a sustainable society when he stated that there is a groundswell of thinking and

action towards that direction, but the main indicators as measured by the annual Worldwatch State of the World reports, or even as reported in daily newspapers, remains deeply worrying. In support, Cortese (2003) argued that the greatest evidence of the need to transform education is the state of the world and the efforts many nongovernmental organisations (NGOs) and schools are making in environmental and sustainability education to 'fix' the traditional education system. This means that education has to be transformative in order to deliver on its promise of serving as a vehicle for the creation of a sustainable world. Lending support to this view, the International Union for Conservation of Nature, United Nations Environmental Programme, World Wide Fund, IUCN/UNEP/WWF, respectively (1991, p. 5 as cited in Tilbury, 1995, p.198) noted that to make people live sustainably will "…require a significant change in attitudes and practices of many people and we will need to ensure that education programmes reflect the importance of an ethic for living sustainably".

Although some of the problems already created by sustainability crises are irreversible, there are still much that could be done to mitigate them. As the world has begun to embrace global education, there is the possibility of producing graduates who will think globally and act locally; graduates who will learn under this field and act sustainably; graduates with changed behaviours and who through learning and practice, will be able to develop values and behaviours that could assist in creating a sustainable society. However, Baring (2010) argued that, it is not possible for our values and behaviours to change unless we change our beliefs. This implies that for the required change to occur there must be transformation of our belief system. With the resulting change and our acting together under the inspiration of a new vision of our role on this planet, humanity could through the transformation of our understanding, be able to extricate ourselves from an outworn worldview and begin to replace the deficient values that have long controlled our culture with new values based on respect for the Earth (Baring, 2010).

Hopefully, there are developments in the education sector that have begun to address this problem. For instance, education has led to the development of new technologies and new methods of production aimed at reducing greenhouse carbon emissions. Ironically, this development has not solved the problem. With an avalanche of new technologies and methods of production in place, the level of pollution, unethical business practices, environmental degradation, over exploitation of natural resources and so on are still on the increase. For instance, with regard to environmental pollution, the continuous anthropogenic

emissions of greenhouse gases (GHG) into the atmosphere have brought about the issue of changing climate (Kumar and Imam, 2013). The authors argued that climate change and air pollution lead to structural damage of built infrastructure such as transport infrastructure (roads, railway tracks, bridges, tunnels, airports, sea ports, earthworks). This damage to built infrastructure is caused by "extreme weather conditions (e.g. more frequent heat waves and extreme rainfall) and long-lived and slow when derived by changing climatic conditions (e.g. increase in the average annual temperature, overall drier summers and wetter winters); such climatic changes have been confirmed by climate models (Hulme *et al.,* 2002; Intergovernmental Panel on Climate Change (IPCC), 2007; Karl *et al.,* 2009 as cited in Kumar and Imam, 2013).

Equally, the transport sector of global economy contributes to air pollution and climate change. According to Proost and Van Dender (2012), the transport sector relies mostly on oil production (gasoline and diesel) for its energy supply. Although there is large awareness of the environmental implications of too much dependence of the transport sector on fossil fuels, not much is yet done to reduce the use of fossil fuels as the major source of energy for the transport sector. Unless a solution to the over dependence of the transport sector on oil is found, there is the tendency that the greenhouse effects of the transport sector could continue for long. However, the dependence on cheap and secure oil for energy supply of the transport sector is partly a solution to the energy problem but this makes the climate problem more difficult to solve (Proost and Van Dender, 2012). With no solution to this problem in sight, greenhouse gas emissions and its effects on climate change have continued to increase. Supporting this view, Proost and Van Dender (2012) stated that despite the longstanding concerns about fossil fuel dependence and strong and rising concerns about climate change, up to now transport's reliance on fossil fuels has not decrease appreciably over time.

In the past few decades, these sustainability crises have continued to attract the attention of concerned citizens, organisations and the governments of different countries. In response, various steps are being taken to redress sustainability crisis. In support of this view, Orr (2006 in Edward, 2006) stated that the evidence of sustainability is seen in how farmers are starting to manage soil preservation, the new way people now strive to protect species and biological diversity, the emergence of green building, engineering and communities, and the increasing number of businesses selling products of services and preserving natural capital as a matter of conscience and profit. He argued that sustainability is also "evident in education

and the emergence of new ways of thinking about human role in nature that extends our perspective to whole system and to the far horizon of imagination (Orr, 2006 in Edward 2006). However, these observations by Orr (2006) may not hold in developing nations of the world. It could be said that this sustainability revolution described by Orr (2006) is taking place more in some countries in the west than in Africa and some Asian countries and many other developing nations. Even then, it is occurring against a backdrop of huge resistance in the developed countries. So, the problem still exists in large proportion.

As part of the efforts toward finding solution to the problems, higher education has been called upon to play the role of training learners to develop the attitudes and behaviours that can enhance sustainable living. In this regard, several international conferences and meetings have drawn attention to the relevance of education for sustainability in higher education (Segala, Ferrer-Balas and Mulder 2008, p.298). For instance, Stockholm declaration, Tbilisi declaration, Talloires Declaration, Halifax Declaration, and Chapter 36 of the agenda 21 in Rio Declaration, to mention a few, have been signed by many countries. This response suggests that the evidence that we must transform the systems that are responsible for overshooting our planet's limits such as those that cause global emissions and impending climate catastrophe is indisputable (Soderquist and Overakker, 2010). Using education as a tool for changing the attitudes and behaviours of learners to live sustainably will require influencing learners to engage in playing new role and reordering of human intentions to be in line with the way the biophysical world works (Orr in Edward, 2006).

To achieve the needed transformation for students to live, behave and act sustainably, Segala, Ferrer-Balas and Mulder (2008) suggested that specific courses are needed to bring about the basic understanding of the challenges associated with sustainable development; to equip the learners with the tools and models for dealing with dynamic and complex systems; and to understand how things are interconnected. However, it is not only the introduction of specific courses into the curriculum that could lead to transformation of learners to live sustainably. The way the courses are taught, the scope and the spread of the courses across disciplines could also be play important part in making learners understand the challenges associated with sustainable development. For instance, Holmberg and Samuelson (2006 as cited in Segala, Ferrer-Balas and Mulder, 2008) argued that the specific courses delivered at universities today are mainly concerned with environmental issues. But it is not only environmental issues that constitute the global sustainability problem. Economic and social

issues are also implicated. In fact, it is economic issues that are the root causes of sustainability crisis. To reverse this trend, Segalàs, Ferrer-Bala and Mulder (2008) opined that we need a fundamental, transformative shift in thinking, values and action and in this regard, higher education institutions responsibility is to educate graduates to achieve the moral vision, attitude and behavioral changes that are necessary to assure the quality of life for the future generations.

Education for Sustainable Development involves including key sustainable development issues into teaching and learning; for example, climate change, disaster risk reduction, biodiversity, poverty reduction, and sustainable consumption; engaging students in participatory teaching and learning methods that motivate and empower learners to change their behaviour and take action for sustainable development (UNESCO, 2013). In other words, teaching about sustainability, and sustainable behaviours ought to lay emphasis on the interconnections between human attitudes and behaviours and sustainability issues. It should also aim at provoking the learners' ethical concern for people and the environment, and making learners to see and respect the interconnections between all things – living and non-living. Thus, sustainability education ought to be transformative. Transformative learning involves a learning pattern that leads the learner to "questioning the integrity of deeply held assumptions and beliefs based on prior experience" (Taylor 2009, p.7) by critically reflecting on such held assumptions and beliefs. Transformative learning builds on the experience each learner brings to the classroom (prior experiences), what he or she experiences in the classroom and critical reflection that results to engagement of the learner with the self and others (Taylor, 2009). The essence of transformative learning is to bring about a change in the behaviours and attitude of the learner.

To achieve a true sustainability will require a change in consciousness to bring about new behavior pattern, a new way of thinking and acting that is different from the old ways of thinking and acting that led to sustainability crisis. This is important because there is no way we can experience change in behaviour without a shift in consciousness. A radical shift in consciousness from personal to transpersonal (Collins, 2010) which transformation could create in the learner will make sustainability education to have practical values. This is possible because the moral, spiritual and ethical changes that result from transformation in the life of an individual could make the learner to see economic (the world of business) beyond profit making, and also to see the need for social justice as an obligation. In educating

learners to develop new perspectives and new consciousness for living sustainably, transformative learning ought to be considered fundamental.

Transformative learning alters the learner's frame of reference and the meaning schemes that learners' use to make interpretation of prior assumptions. This revision of frame of reference leads to perspective transformation. Perspective transformation is the central focus of transformative learning. Supporting this view, Taylor (2008) stated that transformative process is formed and defined by a frame of reference. Frame of reference is defined by Taylor (2008, p.3) as "… structures of assumptions and expectations that frame an individual's tacit points of view and influence their thinking, beliefs, and actions". The author noted that the paradigmatic shift that is called perspective transformation results in the revision of frame of reference which in concert with reflection on experience that is addressed by the theory of perspective transformation, can change the attitude and behaviour of individuals. The learners who are transformed in the proper sense of the word should consider the implications of their activities and, or the impacts of their actions on the environment in their daily living. Therefore, in order to live sustainably, one must first develop a frame of reference that enables him or her to reflect on the implications of not living sustainably. This is where education that has transformative contents could serve as an instrument for producing learners with sustainable lifestyle.

Perspective transformation is fundamental to changing the way humankind thinks and acts. The impact of perspective transformation in the way one thinks was well illustrated by Marie Claire's story; an American, who described the changes in her assumptions on moving to Switzerland. According to her, moving to Switzerland changed her perception from thinking like every other person in America that her country was the best to starting to think of her country is not being number one (Taylor, 2008). Marie Claire's transformation came as a result of her intercultural experience, critical reflection on her experience, and engaging in dialogue with others (Taylor, 2008). The author explained that it was through Marie's interactions with people from other cultures that led to her questioning her deeply held assumptions about her own culture. However, the knowledge gained from education might have contributed to broadening Marie's worldview and interpretation of reality. Similarly, education could broaden learners' perception of issues like sustainability crisis and lead to transformation towards sustainable living. It can be argued that sustainability education without transformative learning that goes to the depth of the problem could be insufficient for

the transformation of people and might only serve as a superficial approach to addressing sustainability crises. In the words of Sterling (2011, p.19), "it is not just that it does not work but too much environmental knowledge (particularly relating to the various global crises) can be disempowering, without a deeper and broader learning process taking place".

## 1.4 Statement of the Problem

There are claims that higher education today may be producing students with only the skills and knowledge to function within the existing society paradigm. In support of this view, Cranton and King (2003) stated that higher education today may be producing graduates that are little more than obedient citizen's that are only ready to work within society's institutions, professions, and organisations. This implies that graduates of today are merely equipped with the information and skills that help them to follow the trend in the society rather than the knowledge and skills required for making positive changes in society. Glisczinski (2007) said that this type of learning reduces learners to replicators that merely follow inherited mental maps, which could be unreliable for navigating the current dynamics of postmodern life, and does little to address the poverty of understanding in society. Thus, it is not even clear whether liberal education is transformative. However, within the context of liberal education, there exists the global forms of education which aims at transforming the worldviews of learners through the discussion of global issues (Selby, 2004).

In order to confront sustainability issues/problems, the world needs minds capable of creating new possibilities for meeting basic needs such as energy, water, housing and food; minds that can transform daily experiences into ones that allow for a sustainable development, safeguarding opportunities and the environment for future generations. The avenue for producing reflective minds could be provided by global education system. However, none of the few studies so far conducted in this area (e.g. Joseph and Routh, 2002; Krizek, Newport, White and Townsend, 2012; Sterling and Scott, 2008; Kazdin, 2009; Shephard, 2008; Chalkey, 2006; Segalas, 2008; Palmer and Cochran, 1988) has attempted finding out whether global education approach is developing critical thinking and reflective minds that could assist in the transformation of learners towards sustainable living.

A review of available literature indicated that most of the studies on sustainability that related to universities concentrated on how universities go about making the campus green rather than the assessment of the outcomes of sustainability education or the global education

approach and how it is impacting on the students toward developing sustainable living habits (e.g. Akel, 2006; Beringer, 2007). While greening the campus is important, it does not solve the larger problem of creating a sustainable society. It may also not be sufficient to transform students into global citizens with sustainability vision for the society. Therefore, the problem of this study is to find out how global education contributes to the transformation of learners towards sustainable living. The importance of this hinges on the fact that sustainability crisis is causing a lot of problems to humankind. It is shrinking the possibility of the future generations inheriting a sustainable society where peace and social justice are assured and poverty and environmental degradation are minimal. It is as well putting the survival of the present generation in jeopardy.

## 1.5 Aim of the Study

The aim of the study is to find out whether global education transforms leaners towards sustainable living

## 1.6 Objectives of the study

The objectives of this study are as follows:

1. To find out the transformative experiences of university students under Global Education.
2. To find out how global learning leads the learner to reconsidering his/her previous assumptions and reinterpreting formerly held views.
3. To find out the role of Global education in the transformation of students towards sustainable living.
4. To provide suggestions and recommendations on how global education could be used to create sustainable citizens.

## 1.7 Research Questions/ Hypotheses

**Focal Research Question:** In this study, the focal research question is: Is there a transformation of learners towards sustainable living under the Global Education approach? In order to address this question, the following sub-questions were put forward:

**H$_1$:** University education under Global Education approach transforms learners to live sustainably.

**Ho:** University education under Global Education approach does not transform learners to live sustainably.

1. Do learners experience transformation towards sustainable living under Global Education?

2. Is there a relationship between what learners learn under Global Education and sustainable living?

3. How do learners describe their transformative experiences under Global Education?

4. How can Global Education help in making students at university to live sustainable lifestyle?

In the quantitative question, H1 represents alternative hypothesis while Ho represents null hypothesis. Where either of them was accepted, the other hypothesis was rejected.

## 1.8 Methodological Approach to the Study

The research method for this study is the mixed methods research. This method of research combines qualitative and quantitative approaches in one study. Mixed methods research is a research design that has philosophical assumptions and also serves as a method of inquiry (Cresswell and Plano Clark, 2007). As a methodology, its philosophical assumptions guide the collection and analysis of data and the mixture of qualitative and quantitative approaches in many phases of the research process (Cresswell and Plano Clark, 2007). Mixed method design was considered as appropriate for this study because of its inherent strengths. Greene, Caracelli and Graham (1989, p.256) defined mixed method design as "those that include at least one quantitative method (designed to collect numbers) and one qualitative method (designed to collect words), where neither type of methods is inherently linked to any particular inquiry paradigm".

## 1.9 Significance of the study

The findings from this study will be of benefit to individuals, organisations, government/publics.

**i). Individuals:** Teachers involved in education for sustainable development need to know the impacts they are making on the learners. This study provides a framework for measuring such impacts. By exploring the transformative experience of university students towards sustainable living, the study provided evidence of transformation that students undergo as a result of the teaching and learning that take place under global education approach. The study will therefore help teachers to know how much the current education system is contributing to the building of a sustainable future. In addition, the views of the research participants on the contributions of global education to transformation of learners could be used by teachers and educators to identify problem areas in the teaching and learning of sustainability. It is when problems are identified that they could be solved.

**ii).Business Organisations:** Business organisations will benefit from this study. The activities of some business organisations have been identified to be responsible for creating sustainability crisis. In support of this view, Kottler (2011) stated that with regard to marketing, companies and their marketers have operated on the assumption that resources are limitless and the way goods are produced, distributed and the pattern of consumption are not contributing factors to pollution, water shortage, and other costs, or at least that companies do not have to bear these costs. Because most of these organisations are managed by graduates educated under global education field, there is need to train them to graduate with good knowledge of the implications of unsustainable corporate and individual behaviour. This is because the knowledge and skills students acquire in the university count much in the management of organisations when they become managers. It is therefore important to investigate the experience of transformation of university students towards sustainable living. Supporting the importance of this study, Kottler (2011) opined that once students who graduate in different marketing capacities are equipped with the knowledge of sustainability, they will begin to acknowledge resource limitations and externality, and marketing will have to change its practices to be environmentally responsible.

Furthermore, evidences provided by this study will enable business organisations to know the type of training and orientations to organise for their new employees. Training based on gaps

identified and filled by this study with respect to the level of transformation that takes place in the lives of students at university could be effective. On the other hand, training organised without the knowledge of what the students know and what they do not know about sustainability will perhaps not adequately address the sustainability needs of learners and society.

**iii. Government/Public:** This study will help to make policy makers in the education sector to understand more about the relationships between global education, transformative learning and sustainability. This understanding is important for crafting of sustainable development curriculum at university. The contents of curriculum based on the views of students on the transformative power of global education, especially in the area of sustainable living could enhance students learning about sustainability.

Again, because this study explored the shifts in structure of learners' consciousness and what in Global Education triggers off such shifts, it is important for planning the contents of education for sustainable future. This is vital at this time when education for sustainable development is spreading across universities and colleges and gathering momentum at global level. Thus, universities providing sustainability education and those intending to introduce it will benefit from the findings of this study in the development of their educational curriculum. In addition, given that under global education approach, global issues such as the problems posed by sustainability crises and how to create a sustainable society are central, there is a need for a study like this to find out the role university could play in the transformation of the attitudes, beliefs and behaviours of learners to live sustainably.

**iv. Future Research:** Finally, the study reviewed scholarly literature in the areas of Global Education, transformative learning and sustainability and linked these concepts together in order to establish their relationships. The bringing together of these concepts provides literature in a way that is unique for students undertaking a study in this or related areas to consult. In addition, the study identified gaps in current literature which time and resources available to the researcher did not permit investigating. These gaps provide areas for further studies.

## 1.10 Limitations and Scope of the Study

The study limitations are methodological, conceptual and researcher's own bias. These three issues affected the study in different ways.

**i. Methodological Limitation:** While the methodology used for this study and the attendant rational are explained later, suffice to indicate that the mixed method approach has been used. The mixed method research used in this study has inherent limitations. Because each of the method that combine to make up mixed method was used as an independent method before integration occurred, the limitations inherent in the qualitative and quantitative approach manifested at each level. However, these limitations were mitigated by the process of data triangulation and the integration of the methods at different stages of the study. In support of this approach as a means of offsetting the limitations in the sequential mixed methods research design, Jick (1979) stated that the effectiveness of triangulation rests on the premise that the weaknesses inherent in either the qualitative or quantitative method will be compensated by the counter-balancing strengths of another.

In addition, it was difficult to determine how the data obtained from each single method could be weighted to find areas of agreement. For example, should all components of the qualitative and quantitative approach be weighted equally, that is all the evidence considered equally useful or weighted based on personal preference? (Jick, 1979). The weighting of the evidence based on personal preference introduces own bias into the methodology and makes the determination of the approach subjective. Jick (1979) noted that the concept of 'significant differences' when used to qualitatively judge differences does not readily compare with the statistical tests which also demonstrate significant differences". To reduce bias in the use of this approach, the researcher used the result obtained from the qualitative approach to underpin the results obtained from the quantitative data.

**ii. Conceptual Limitations:**
Each of the three concepts - global education, transformation and sustainability – which this study attempted to link and make sense of how they relate to each other has multiple meanings. Global education means more than one thing, so do transformation and sustainability. This multiple meanings of each concept made concept clarification difficult. However, to address this problem, the researcher explained the context within which the

concepts were used. Also, the operational definitions of the concepts were provided in this study to pin down the meaning the researcher attached to their usage.

**iii. Time and Financial Constraints:** The study was limited by the time available and financial constraints. Time and budget made it difficult and impossible to access the changes that might have occurred in the behaviours and the ways of living and acting of the research participants months or years after the collection of data. It is possible that the participants may have experienced further transformation in their worldviews and actions which influence sustainable living after the data collection than the time the data were actually collected. However, the follow up check was considered as beyond the scope of this study. To accommodate the follow up, the result from this study could enable those carrying out research that permits follow-up-checks to compare the findings from this study with theirs.

In conclusion, education is perceived as a vital means of equipping people with the knowledge and skills required for living sustainably. As a result, global form of education started to receive greater attention in the early 21$^{st}$ century when nations began to form alliances aimed at increasing international exchanges of students and collaborations in the areas of research and development. In the next chapter, the reasons for cross-border movements of students, especially from developing countries to developed countries for study are examined. Also, the theory of Reasoned Action and the System Thinking Theory as used to support this study are explained.

## 1.11 Conceptual Framework

The conceptual framework in Figure 1.1 guided the development of the research methods used for this study. The key to the development of this framework is the conceptualisation (Dick and Basu, 1994) of global education and transformative learning as interrelated concepts. These two concepts could be linked together in a learning process to make learners develop sustainable lifestyle. The framework is an integration of concepts which requires a mixed method approach to investigate how the concepts can work together to produce learners with sustainable behaviour. The investigation of these interconnections between global education, transformative learning and sustainability informed the choice of mixed methods research for this study.
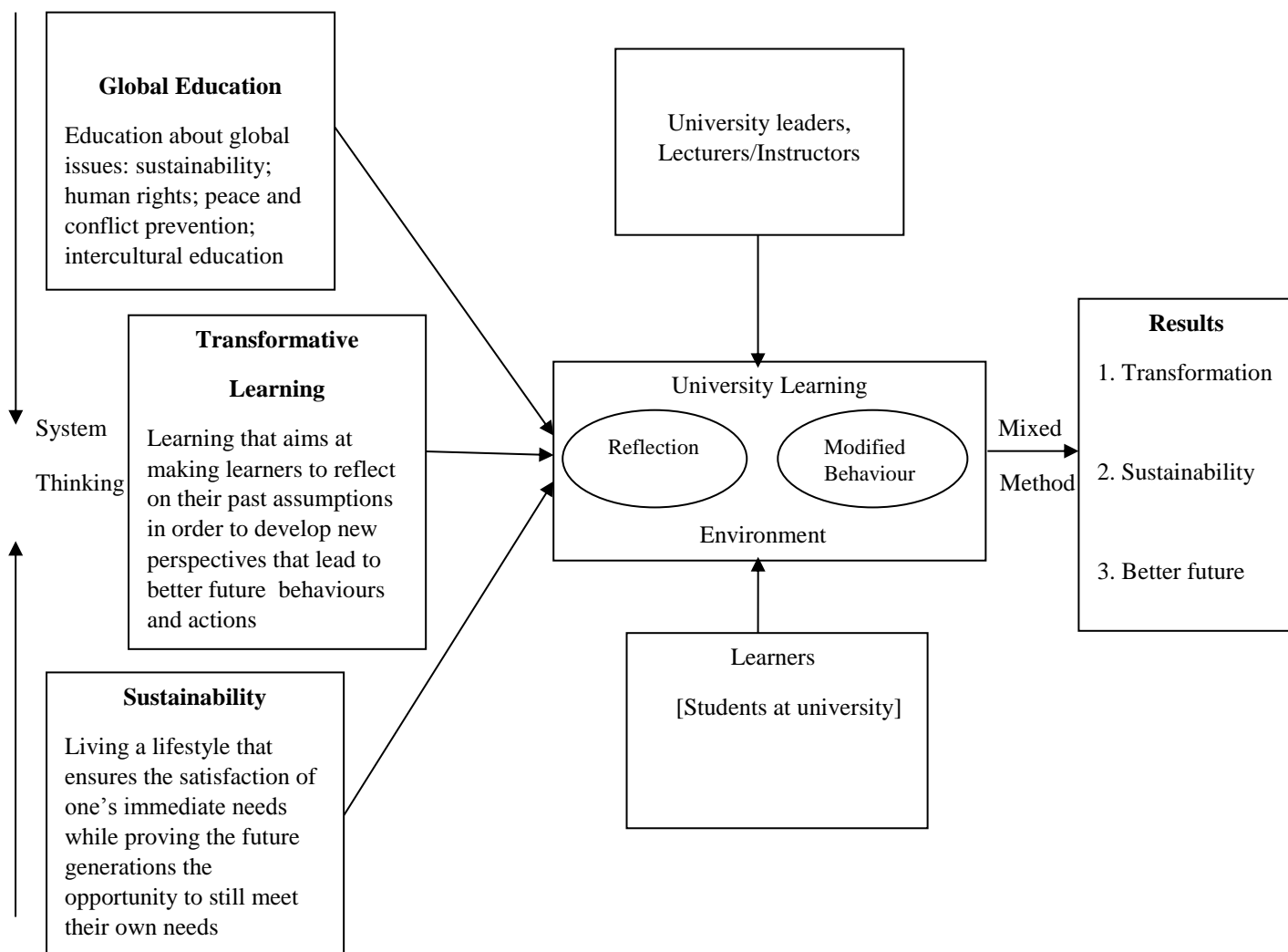
**Figure 1.1:** Conceptual Framework for Transformation towards Sustainability

**Source:** Author's source

The conceptual framework shows that global education, transformative learning, and sustainability work together to make learners reflect on their previous assumptions about life. This reflection facilitated by experts within university environment could lead to behaviour modification. The evidence of change in behaviour of students exposed to global education can be seen from the results obtained in the analysis of both the qualitative and quantitative data in this study (see chapter five). The results show that learners experience some levels of transformation that enhance sustainable living. This could lead to the realisation of a better future.

# Chapter Two

## Contextualizing the Themes and Issues

### 2.1 Introduction

Global education emerged, largely as a phenomenon of capitalism, globalisation and internationalisation – with developing countries seeing the need to be able to compete in business. Globalisation opened the borders for freer movement of people while internationalisation of higher education as an aspect of globalisation provided more opportunities for the movement of students across borders. This development has shaped much of the university curriculum of countries that host international students. In specific terms, the internationalisation of education means the imparting of knowledge, skills and values that are of global importance and it involves planning a curriculum that are cross-national and intercultural in nature (Varghese, 2008).

As a result of the emergence of global education approach, many developing countries now send students to developed countries for higher education. Thus, Global Education brings together students from diverse cultural backgrounds for exposure to perspectives and increasing knowledge and understanding of the global forum. Several reasons account for the movement of students across cultures. Some of these reasons are to learn and share experiences (Li and Bray, 2007), to get quality education (Lee and Tan, 1984), escape from unfavourable conditions in the home country and meet with multinational classmates (Li and Bray, 2007). Perhaps, the need to acquire the knowledge and skills one needs to meet up with personal needs and the needs of the society are also responsible for international movement of students. Cummins (1993 as cited in Varghese, 2008) summarised the major reasons for overseas study into three categories: (a) lack of domestic facilities, particularly in some subject areas, made many students/governments to seek education in other countries; (b) the commercial value of a foreign degree encouraged individuals to seek higher education overseas; and (c) knowing and gaining experience in another country and culture inspired many to seek education in foreign countries. The first two factors imply that students seeking for higher education in foreign countries consider the quality of education in their host country as superior to what obtains in their home country. Supporting this view, Varghese

(2008) argued that the steady flow of students from developing countries to developed countries is because of the belief that there is high standard and better quality education in developed countries. In this chapter, the reasons for this cross-border movement of students, especially from developing countries to developed countries are discussed.

## 2.2 Reasons for Cross-border Movement of Students from Less Developed Countries and newly Industrialised Countries to Developed countries

Some research conducted on the movement of students across borders showed that there are several reasons for the cross-border mobility especially from less developed countries (LDC$_S$) to developed countries (DC$_S$). For African countries and some Asian countries which account for greater percentage of the LDC$_S$ sending students to developed countries, the findings from a study by Lee and Tan (1984), on the determinants and implications of international flow of third level lesser developed country students showed that the most important of flow of LDC$_S$ level students to DC$_S$ of America, UK and France is "the significance of excess demand". Excess demand is interpreted here as the higher demand for returning students from developed countries in the less developed countries usually the sending countries (Lee and Tan, 1984). This excess demand can be said to be induced by the higher quality of education the students from the less developed countries are believed to have acquired in the developed countries.

Also, it is argued that the movement of students from one country to the other for higher education is to get higher quality education. Supporting this view, Varghese (2008, p.23) explained that "students seeking cross-border higher education in general move from countries where the education system is less developed to countries where universities are more developed". Contrary to the above view, Lee and Tan (1984) research finding showed that the higher standard of education in some of the developing countries makes it possible for students from the less developed countries to qualify for admission into postgraduates and even undergraduate studies in the developed countries. In the words of the authors, the higher quality education in the developing countries implies that its third level students will be better qualified to gain access to postgraduates and even undergraduate education in developed countries (Lee and Tan, 1984).

For students that come from newly industrialising countries like China to study in the UK, America and France, students' mobility is taken as a process of economic globalisation and internationalisation process. Although both globalisation and internationalisation are considered as threat in some countries, in other settings they are seen as opportunities (Li and Bray, 2007). In China, the opportunities have generally been considered stronger than threats, and certainly many of the students and institutions in China have been keen to grasp new opportunities for relating with other countries, influences, resources and interest in new era (Li and Bray, 2007). The authors stated that from the perspective of the policy makers, "internationalisation of higher education is a deliberate mechanism to achieve these goals".

Other factors identified in research findings as responsible for the movement of students from less developed countries to the developed countries for higher education are what Altach (1998 as cited in Li and Bray, 2007) called push-pull model. Some students were pushed by unfavourable conditions in their home countries, while others were pulled by scholarships and other opportunities in the countries of their destination (Li and Bray, 2007). The pull factors of the host countries as enumerated by Li and Bray (2007) include advanced research facilities, congenial socio-economic and political environments, and the prospect of multinational classmates. The researcher shares the same view as these authors. As available statistics indicates, the flow of students from less developed countries to developed countries for studies has continued to increase.

As shown by the figures released by the Higher Education Statistics Agency, HESA, (2011-2013), the number of international student that come to the UK each year has been on the increase except for India that declined between 2010-2012 from 39, 090 to29, 900 students (See table 2.1).

**Table 2.1: Top non-EU sending countries**

**Top ten non-EU sender**

| Country of domicile | 2010/11 | 2011/12 |
| --- | --- | --- |
| China (PRC) | 67,325 | 78,175 |
| India | 39,090 | 29,900 |
| Nigeria | 17,586 | 17,620 |
| United States of America | 15,555 | 16,335 |
| Malaysia | 13,900 | 14,545 |
| Hong Kong (Special Administrative Region) | 10,440 | 11,335 |
| Saudi Arabia | 10,270 | 9,860 |
| Pakistan | 10,185 | 8,820 |
| Thailand | 5,945 | 6,235 |
| Canada | 5,905 | 6,115 |

**Source:** UKCISA, 2011-2013

The table shows UK Council for International Students Affairs (UKCISA), 2011-2013 report of top non-European Union countries that send students to United Kingdom for higher education. Among the top 10 non-European Union senders as shown in table 2.1, China is the leading country followed by India, Nigeria, and United States and so on.

**Table 2.2: Top European Union (EU) sending countries**

**Top 10 EU sending countries (Source:** UK Council for International Students Affairs (UKCISA) 2010-2011).

| Top 10 EU sending countries | 2010-11 | 2011-12 |
|---|---|---|
| Germany | 16,265 | 15,985 |
| Republic of Ireland | 16,855 | 15,075 |
| France | 13,325 | 12,835 |
| Greece | 11,630 | 11, 630 |
| Cyprus | 11, 620 | 11,790 |
| Poland | 7,330 | 6,295 |
| Italy | 7,100 | 8,010 |
| Spain | 5,795 | 5,935 |
| Romania | 4,625 | 5,915 |
| Bulgaria | 4,615 | 5,705 |

The table shows top 10 EU sending countries of students to the United Kingdom for higher education. The cross-mobility of students exposes them to new culture. It is acknowledged in the literature on international sojourn that exposure to a new culture has transformative power (Brown, 2009). This results from increase in cross cultural understanding of the sojourner (Adler 1975; Kim 1988; Ward, Bochner and Furnharn, 2001 as cited in Brown, 2009)

## 2.3 Theoretical Framework

This study was based on two theories of learning: the Theory of Reasoned Action and the Systems Thinking Theory. The choice of these theories was informed by their relevance to the formation of attitudes and behaviours of individuals.

## 2.3.1 The Theory of Reasoned Action

The Theory of Reasoned Action is based on the proposition that the behaviour of an individual is determined by the individual's behavioural intention (BI) to perform that behaviour, which supplies the most accurate prediction of behaviour (Fishbein and Ajzen, 1975 as cited in Chang, 1998). Behavioural intention is determined by two factors: one's Attitude toward the behaviour (A) and Subjective Norm (SN) (Chang, 1998). Attitude toward behaviour is defined as "a person's general feeling of favourableness or unfavourableness for that behaviour" (Ajzen and Fishbein, 1980 as cited in Chang, 1998. P.1826). Subjective Norm is defined as "perception that most people who are important to him think he should or should not perform the behaviour" (Ajzen and Fishbein, 1980 as cited in Chang, 1998, p.1826). Attitude toward behaviour is a function of the result of one's salient belief (B) that performing the behaviour will lead to certain outcomes, and an evaluation of the outcomes (E), that is, rating of the desirability of the outcome.
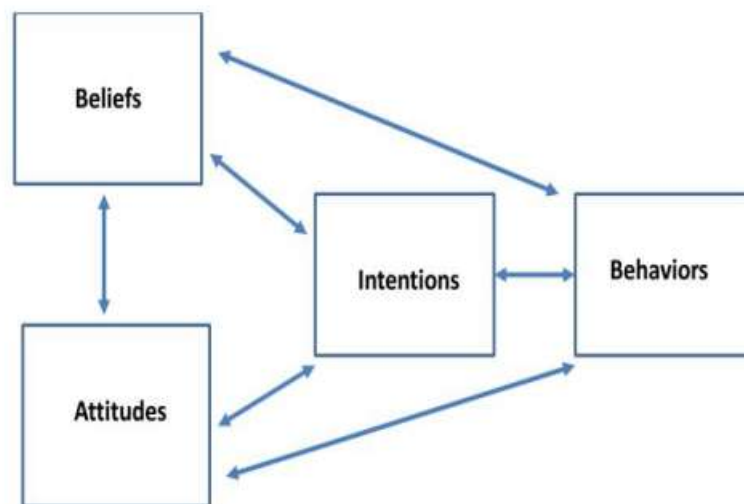


**Figure 2.1:** Theory of Reasoned Action

**Source:** Tello, G. Swanson, D. Floyd, L. and Caldwell, C. 2013. p.108.

The Theory of Reasoned Action developed by Fishbein and Ajzen (1975) indicates that an individual's behaviour arises from interrelated combination of how one thinks and feels about

a concept or idea, which then promotes the intention to act that result in actual behaviour (Fishbein and Ajzen, 2009 cited in Tello, Swanson, Floyd and Caldwell, 2013). Thus, if through education and learning, one is made to develop a positive thinking about living a sustainable lifestyle, it is likely that the individual could begin to act in the ways that enhance sustainable practices. Sometimes, however, behaviour may be guided mainly by attitudinal considerations (i.e., by beliefs about the possible consequences of the behaviour and the evaluation of these consequences), and normative or control considerations may be irrelevant (Fishbein and Ajzen, 2009). Behaviour is the function of one's beliefs, attitudes and intentions (see Figure 2.1 above). In applying the Theory of Reasoned Action to influence the way students behave, the extent to which faculty influence students' behaviour is a function of the impact of their cognitive, affective and conative dimensions of teaching (Vallerand, *et al.,* 1992 cited in Tello, Swanson, Floyd and Caldwell, 2013). This implies that the model of transformative learning include three cognitive elements from Bloom's Taxonomy, three affective elements from Finks Taxonomy of Learning, and three conative elements of Transformational Learning (Tello, Swanson, Floyd and Caldwell, 2013) as illustrated in Figure 2.2 below:
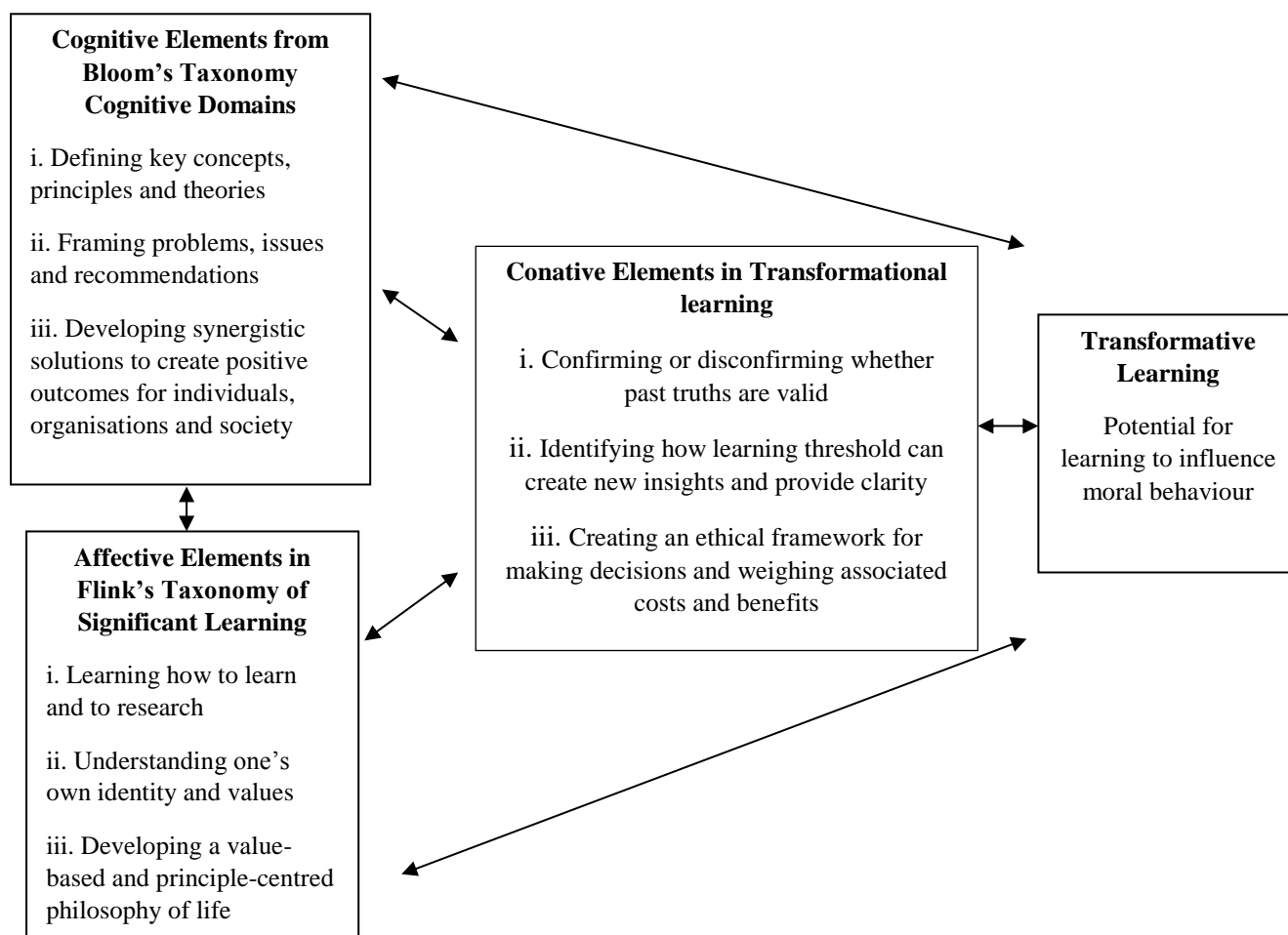
**Figure 2.2:** Transformative Learning Model. **Source:** Adapted from Tello, G. Swanson, D. Floyd, L. and Caldwell, C. 2013, p.108.

Transformative learning develops how to understand and use knowledge aimed at creating value for the learners, organisations and society (Tello, Swanson, Floyd and Caldwell, 2013). It combines elements present in the theory of Reasoned Action (Fishbein and Ajzen, 1975 as cited in Tello, Swanson, Floyd and Caldwell, 2013) to describe the relationships between belief, intention to act and the actual behaviour that people engage in (Hale, Householder and Green, 2003). However, for transformative learning to occur in an individual, the person engages in self-reflection, evaluating the likely benefits of allowing him/herself to be transformed. This means that the individual engages in the process of reasoning to determine the favourableness or unfavourableness of undergoing a transformation in attitudes, values and perspective. Thus, it may not be possible for an individual to undergo transformation without considering the essence of allowing a change in the individual's frame of reference to take place. In other words, there is a kind of whole system thinking which enables the prospective individual that is to undergo a transformation to reflect on the possible benefits

and disadvantages of undergoing transformation before yielding to such factors like change in behaviour, attitude and values. That is the individual is likely to reason the need for taking action that indicates the person has undergone a transformation. Such engagement shows that the Theory of Reasoned Action is at work in the life of the individual. Therefore, it can be said that there is a subsisting relationship between the theory of reasoned action, transformative learning and the system thinking theory. The theory of reasoned action and transformative learning exist as subset of the system thinking theory. This is because the system thinking theory interconnects the theory of reasoned action with the transformative learning theory and houses the two theories within its orbit. Thus, these theories are important for a study like this that deals with change in the behaviours and attitudes of learners towards sustainable living.

## 2.3.2 Systems Thinking Theory

The issues of sustainability crises are so diverse that it is difficult to articulate solution to the problems without developing an effective mental model that takes holistic perspective to problem solving. The problems are also so dynamic in nature that they require a kind of thinking that allows the problem solver to adapt to any new development by thinking outside the box to find solution to them. This means that it is not possible to prescribe solution to sustainability crises the way doctors diagnose and prescribe medicine for an ailment. To borrow the words of Soderquist and Overakker (2010, p.193), "the challenges of sustainability are adaptive challenges, and require the development of more effective mental models that support a transition to sustainability". If therefore education is to provide solution to the global sustainability problems, it should be the type of education that involves the systems thinking framework in the teaching and learning processes. Systems thinking, or holistic thinking represents key values of sustainability discourse (Dixon, 2004; Mitchell and White 2003; Peet 1992; Robert et al., 2002 as cited in Abeysuriya, 2008, p.42). It complements reductionism which tackles problem by reducing them into smaller isolated components and emphasizing the interconnectivity of components in forming the whole (Abeysuriya, 2008, p.42). In so doing, systems thinking help us to understand the deeper structure of any problem, particularly such problem as sustainability crisis that is multifaceted. Sustainability problem is multifaceted because it has economic, socio-cultural and ecological dimensions and each dimension has further dimensions. This multifaceted nature of sustainability crisis requires that humanity should search for ways of influencing the

different systems that constitute the whole without compromising the interconnectedness between them.

If through Systems Thinking, we are able to understand the deeper structure of the problem, and see the connection between our behaviour and the creation of a sustainable society, we can come to the recognition that humans has the capabilities to deal with the complexities and interconnections (Wheatley, 2001) between us and our planet. Humans are reflective beings capable of drawing from their past experiences in order to find solution to problems they perceive as emanating from their prior assumptions, beliefs and actions. They are also associative in drawing meanings because humans have always attributed those problems that arise in our daily lives to one cause or the other, especially when they become aware of the problem(s) and not sure of the cause. This reflexivity is inherent in human nature although it can further be enhanced thorough the process of transformative education. It is also an important element in systems thinking as there can be no system thinking without reflection.

Systems thinking works on the understanding that no action is unilateral in its impact and that when we change one element of a system, we have to acknowledge that such change will influence in different degrees the other elements of that system as well (Salisbury, 1996). This also applies to changes that occur in human behaviours and how this changes impact on the lifestyle of the transformed person. For example, when transformation especially perspective transformation has taken place in an individual, it occurred because the transformed person was able to question his/her assumptions and the need for change. Through the process of questioning and reflection on the purpose of life, individuals could come to the realisation that it is ethically and morally reasonable to live sustainably. If such change occurs in a person's life, transformation has taken place.

Furthermore, Systems thinking make it possible for one to see the whole rather than the parts. Sustainable living requires seeing the whole and treating every part of the system as part of the whole that cannot be separated and considered in isolation. In this sense, business organisations with the intention to act sustainably will need to consider not only profit making as their ultimate goal but should also take into account what the consequences of the methods of production will be on the environment. Similarly, the farmer who wants to engage in large scale food production will need to think of the environmental pollution and the health hazards the application of agrochemicals could cause to the people and the planet. He will

equally need to think of the damage the production methods can do to biodiversity that provide life support for all living things. These considerations imply that creating a future that is sustainable is not possible with human knowledge that sees things in fragmented form. A disconnected way of seeing reality does not take the whole into account. Disconnected view of reality resulting from fragmentation of what is whole could be detrimental to the creation of a sustainable society. Supporting this view, Morin (1999 cited in Swelling and Annecke, 2012, p.6 of part 11) stated that intelligence that is fragmented, compartmentalised, mechanistic, disjunctive, and reductionist breaks the complexity of the world into disjointed pieces, divides up problems, separate that which is linked together, and renders one-dimensional the multidimensional. The author argued that it nips in the bud all opportunities for comprehension and reflection, removing at the same time all chances for corrective judgement, or long term view in all its complexity and it also blinds intelligence, fosters unconsciousness and irresponsibility (Morin 1999 cited in Swelling and Annecke, 2012).

System thinking teaches us that for sustainable society to be, we must understand that the economy, the environment, ecology and the social life on earth are all interconnected and they have to be treated in such a way that the attempt to exploit any of them will not destroy the rest. Buttressing the importance of systems thinking in addressing complex issues such as sustainability crisis, Senge (1990, pp. 68-69 as cited in Sterling, 2003, p.68-69) stated that "Systems thinking is a context for seeing wholes. It is a framework for seeing interrelationships rather than things, for seeing patterns of change rather than static 'snapshots'…". In this definition is the idea of wholeness. When we are engaged in whole systems thinking, our individual actions can connect to achieve ecological and environmental sustainability. By going beyond the dominant form of thinking which is analytic, linear, and reductionist, we see ourselves engaged in whole system thinking which provides the bases for understanding the emerging ecological paradigm (Sterling, 2011).

Looking at it in a brief way, "… systems thinking is: relational rather than non-relational; systemic and connective rather than linear and fragmentary; concerned more with process rather than substance, with complex dynamics rather than limited cause-effect, with pattern that connects rather than detail, with wholes rather than parts" (Sterling 2003, p.102). These characteristics make systems thinking a relevant way of developing a worldview that connects rather than fragments the knowledge base that is required for tackling sustainability

problems. For sustainability to come about and endure, everything should be the signature of the whole (Selby, 2004).

Traditionally, most problems were viewed from mechanistic or bounded point of view, without concern for the systematic relationships of variables (Tanji and Kielen, 2003). Such view of problems failed to take into account the larger number of interactions and relationships within the system. However, our planet is a system, an "organized whole, specifically a portion of the world that is recognised as 'itself' in spite of continual changes taking place within it" (Marine, 1997). In the new way of thinking and solving of social problems, instead of isolating smaller and smaller parts of the system being studied, system thinking works by expanding its view to accommodate larger and larger number of interactions as an issue is being studied (Aronson, 1996). Therefore, Systems thinking offers humanity the leverage to think of how to solve problems from different perspectives. It assumes that there are no right answers to a problem; that solution to a problem is fashioned out by discovering the interrelationships between the system and its parts. It therefore offers the problem solvers the opportunity to engage in both vertical and horizontal thinking. Frey (2003) stated that, vertical solutions are based on existing ideas or knowledge-solutions that others have already had success with. Thinking vertically is something like drilling deeper in an existing oil well." On the other hand, horizontal thinking involves coming up with different ideas by thinking in totally new directions (Frey, 2003).

The system theory presupposes that we look back to see where we were, examine our present to see where we are now and look at the future to determine where we are going to be in the years ahead. In the discussions that follow, the researcher approached the investigation of transformation towards sustainable living by looking at the interconnections between sustainability, transformation and Global Education system. This is system thinking approach which I believe to be a clear and helpful way of suggesting the relationships between these three concepts (Sterling, 2003).

The next chapter reviews literature on transformation towards sustainable living. It emphasises more on the major concepts and constructs used in this study and attempt to link these constructs together in order to highlight their relationships as illustrated in Figure 2.3:

## Basis for Transformation

Transformation towards sustainable living has become important as a way of addressing sustainability crisis. This is because humankind is now living beyond the carrying capacity of the planet. The overuse of earth resources and the environmental impacts such activities have on the present and future generations need to be addressed

## Sustainability Discourse

Living a lifestyle that takes into consideration how people could satisfy their immediate needs without jeopardising the chances of future generations satisfying their own needs is what sustainability is all about. Thus, sustainability refers to living within earth's carrying capacity. Living sustainable lifestyle requires that humankind should take care to preserve the environment and ecology.

## Processes of Transformation

**i** Disorienting dilemma

**ii** Identification of previous interpretations

**iii** Engagement in reflective and constructive dialogue, etc

Experience

Reflection

Rational Discourse

## Transformative learning

To make citizens live sustainably, it is important that what they learn at university should be capable of changing their previous assumptions and revise their interpretation of their relationship with the Earth

## System Thinking

## Global Education – Transformative Learning - Sustainability Link

**Global Education** is transformative and holistic

## Dimensions of Global Education

**i** Temporal dimension **ii** Spatial dimension

**iii** Issue dimension. **iv** Inner dimension

**Integration** of Global Education, Sustainability and Transformative Learning

## Role of Education in Transformation of Learners

**i** Education needs to develop learners' ability to live sustainably. **ii** Develop minds that could bring about change. **iii** Equip learners with the knowledge and skills required to address sustainability issues

## Sustainability Practices in Africa, Asia and Europe

**i** Africa: Mostly practised in agriculture.

**ii** Asia: Experiencing increasing environmental burden

**iii** Europe: Industrial isation largely contributing to sustainability crisis

## Paradigm shift

**i** Reorientation of thinking.

**ii** Shift from reductionist to integrative, holistic and ecological thinking.

**Mixed Methods** research was considered best for dealing with a complex multidimensional problem posed by sustainability crisis.

**Holistic Approach** to teaching: engages learners head, body and mind

**Figure 2.3:** Analytical Framework

**Source:** Authors source

## Challenges to Sustainability Education

**i** Right ways to sustainability not clear. **ii** Not every university leader understand reason for pursuing sustainability.

**Data** collection, Interpretation and discussion

The analytical framework shows the relationships between the variables or concepts and constructs examined in this study. It shows that why humankind needs to be transformed is because transformation will bring about a change in attitudes and behaviours required to address issues of sustainability. Because of this relationship, this study examined how learning leads the learner to reconsidering his/her previous assumptions and reinterpreting formerly held views. This occurs through re-examining previous experiences, reflection on those experiences and engaging in rational discourse with others. As the learner engages in critical reflection and rational discourse to evaluate previous experiences, he/she passes through various stages that make up the processes of transformation. How the learners experience transformation towards sustainable living is analysed within the context of global education. To find out the part global education plays in the transformation of learners, there is need to establish the relationship between global education, sustainability and transformative learning and also see whether there a paradigm shift in the way people approach problem solving.

In summary, there are several reasons why students move to other countries for studying. Some of these reasons are to learn and exchange experiences; lack of required facilities for studying certain courses at the domestic level; the need to acquire higher quality education. In the next chapter, a conceptual review of transformation towards sustainable living is undertaken. It critically looked at sustainability discourse, global education, transformative learning, the role of education in creating a sustainable society, paradigm shift, holistic approach to teaching sustainability, and the problems and challenges facing the teaching and learning of sustainability in the university.

# Chapter Three

# Conceptual Review of Transformation towards Sustainable Living in Global Education System

## 3.1 Introduction

An understanding of the reasons why humankind needs to protect the environment is vital for negotiating the path to sustainable living. It is also critical for the discussion of the relationship between global education and the transformation of learners towards sustainable living. This chapter sought to establish how global education impact on learners with regard to sustainable living. It explored the concept of sustainability, transformative learning and global education with a view to finding their relationships in producing learners with the attitudes and behaviours that promotes sustainability. In its investigation, this chapter explored the basis of transformation, concepts of sustainability, transformative learning and global education and how the three integrates and relates as drivers of society to create a preferred future. That is, a future where humanity will live within the carrying capacity of the planet.

## 3. 2 Bases for Transformation towards Sustainable Living

Presently, there is a growing recognition that sustainability is important. This is evidenced by what organisations, government and educational institutions are doing which show that the social and environmental challenges of the 21st century are real and they require that the global economic and political order be grounded in different values and practices (Calder, 1999). Transformation of learners toward sustainable living in the age of sustainability crisis is important as a strategy to help reduce human contributions to sustainability problems and issues. Also, the consequences of unsustainable living have continued to increase. For instance air pollution has resulted in 800, 000 premature deaths caused by lung cancer, cardiovascular and respiratory illness, increase in the rate of asthma, and coronary diseases as well as impairment of lung function (World Health Organisation, (WHO, as cited in Zeneli and Daci, 2011). To reduce these problems require attitude change in the consumption

pattern, waste disposal habits, unethical methods of production and other activities that lead to high rate of greenhouse gas emissions.

Buttressing the increase in the rate of consumption of products that cause toxic waste and pose danger to environment, Roseland *et al.* (2005) stated that the average person in a developed country uses 9 times as much fossil fuel and 20 times more aluminium as the counterpart in developing countries. With respect to waste, the average person produces 4 times as much household refuse, 11 times more carbon dioxide, 26 times more chlorofluorocarbons, and 75 times more hazardous wastes while the average Americans use 43 times as much gasoline as average Indians, 45 times as much copper, and 34 times as much aluminium (Independent Commission on Population and Quality of Life (ICPQL), 1996 as cited in Roseland *et al.,* 2005). North Americans have two times the "ecological footprint" of Europeans, and seven times the average footprint of Asians and Africans (WWF *et al.,* 2004 as cited in Roseland *et al.,* (2005, pp.2-3). These statistics shows that sustainability crisis is not caused by any particular country although some countries with high ratio of energy requirements that lead to carbon emission could be said to be more liable.

However, what is important is not the apportioning of blames but the need to take responsibility to control the situation. In this regard, transformative learning is said to have the potential of changing the attitudes and behaviours of learners. These learners or students could become the leaders of society and organisations. Thus, they need to develop the attitudes and behaviours required for building a sustainable future. Supporting the need to engage students in transformative learning as a way of enhancing positive change in attitudes and behaviours, Butterwick and Lawrence (2009, p.35), defined transformative learning as "a kind of shape-shifting or changing the form of ourselves, our emotions, our thoughts, our worldviews, and our relationship to others, toward a more just society". This learning form is therefore concerned with positive changes in the way people live their lives. However, the impacts that learning could make in the lifestyle of learners is dependent on the learning outcomes intended to be achieved.

Learning outcomes have practical values if the learner can use the lessons learned to solve practical problems. Transformative learning does not rest on passing information from the instructor to the learners. Transformative learning uses more of dialogical approach in which "the learning task involves questioning, responses, comments, reflective observation, and

building of ideas that form a continuous and developmental sequence…articulating, examining, and validating the knowledge that is constructed by the educator and the learners" (Gravett and Peterson 2009, p.100). The authors stated that this approach allows both the learners and the instructor to comment and evaluate what is learned and test it before it is internalised by both. Thus, transformative learning presents learners with the opportunity to engage in the forms of discussions that could change their perspective. Under transformative learning approach to teaching and learning, students have the opportunity to reflect on the ideas they are exposed to. Reflection is vital in taking the right decision on challenging global issues facing mankind. Critical reflection on ideas could be acquired from formal or informal education. For example, children from a cultural background with informed parents could learn or acquire critical reflection from parents. On the other hand, university provides a formal background for educating people to develop critical mind.

As noted by Aziz (2012) students enrol into the university with diverse personal backgrounds, educational levels and perceptions. Findings from research have shown that the attitudes of students change over the course of their first academic year (Besterfield-Sarce *et. al.,* 1994, 1995 as cited in Aziz, *et al*.). This change does not just occur. Changes in students' behaviour in such a short period of time are affected by the type and quality of educational programme the student experience (Aziz *et al.,* 2012). This study argues that transformative Global Education has the capacity to cause changes in the behaviours and attitudes of students and lead them to develop ways of living sustainably. Transformative global education is holistic in nature (Selby, 1999).

In the Global Education field, sustainability education is becoming a major part of the curriculum of many universities. However, it is not clear whether this approach is leading to a shift in the perception of learners towards the need to live sustainably. For instance, in organisations it is still being suggested that changing the way people in the organisation see their roles, responsibilities and relationships (Henderson, 2002) is important for bringing about any other form of change. If the change in methods of production and distribution of goods can help in creating sustainable environment, change in perception of the workforce needs to come first. This is because if perception changes, it could lead to change in behaviour. Supporting the view that change in perception leads to change in behaviour, Henderson (2002, p.189) argued that fundamental changes in perception result to changes in behaviour within the organization.

## 3.3 Sustainability Discourse

Sustainability is a new concept that emerged as a result of the need to manage natural resources judiciously. Von Schomberg (2002) acknowledged that although the concept of sustainability has a longer history, it was not earlier than in the 1987 Brundtland Report published by the World Commission on Environment and Development entitled 'Our common future' that the concept of 'sustainable development' for the first time was introduced in order to establish the linkage between economic development and major environmental problems. According to Waddock (2007) the World Commission on Environment and Development (WCED) sought to provide for a more sustainable and equitable world, arguing that poverty and consumption levels of developed nations were among the major causes of world's ecological problems.

Sustainability has been defined in several ways. Some of the definitions are complex while some are said to be oversimplified. Magala (2012) argued that the usual association of sustainability crisis with global warming, depletion of fossil fuel deposits and the increased emissions of carbon dioxide into atmosphere is a gross over simplification of the causes of sustainability crisis. According to the author, these explanations overshadow other much more important threats to sustainability of human societies which include the threats posed to the survival of human, plants and animal species by the increasing arsenal of nuclear weapons. However, these unique contributing factors to global sustainability crisis are not as widespread as the traditional causes of sustainability such as the burning of fossil fuel, overstretching of earth resources and greenhouse gas emissions resulting from industrial production of goods and waste disposals. In addition, the problem of environmental degradation due to soil erosion and the encroachments of urbanization and communication infrastructure on what use to be agricultural areas, and the problem of social injustice and the inability to manage the inequalities caused by economic and political unfairness add new dimension and values to sustainability issues (Magala, 2012).

Sustainability when used with respect to resources refers to using them in the way that could prevent their exhaustions and simultaneously protect the environment and its ecological and biological diversities. The meanings of sustainability will however, continue to evolve as society advances and new technologies replace the old ones. This evolutionary trend is

evidenced by the new dimensions sustainability has taken since its inception. Tilbury (1995) stated that the concept of 'sustainability' first emerged in the early 1980s but that the term did not begin to form part of the vocabulary of environmental education until 1990. The author said that sustainability, which was first brought to limelight by the World Conservation Strategy (IUCN/UNEP/WWF, 1980) and later reinforced by the Brundtland Report (World Commission on Environment and Development, WCED, 1987) refers to:

(a) The need to balance economic development with environmental conservation;

(b) The need to place any understanding of environmental concerns within a socio- economic and political context;

(c) The need to look at environmental concern and economic concern as one and the same issue.

The attempt to include the multiple dimensions of sustainability in this definition is an indication of its complexity. Phillis and Andriantiatsaholininiana (2001) argued that sustainability is difficult to define or measure because it is by its nature a vague and complex concept. This argument is possibly true because sustainability has no meaning without pinning the usage down to a particular context. Philis, Grigoroudis and Kouikoglou (2011) stated that there is no generally accepted definition or assessment of technologies of sustainability. They pointed out that in addition to its scientific challenges, the concept is loaded politically. This statement suggests that it has been difficult for scholars of sustainability education to arrive at a consensus definition of the term. In support, Hardings (2006, p.229) noted that irrespective of the millions of articles and thousands of proposed definitions of sustainability, the meaning of the concept is still a contested issue. The complexity of the term has made Moldan and Dahl (2007) to suggest that it is probably not possible or even important to arrive at one standard definition of sustainability because such dynamic concept must evolve and be refined as human experience and understanding develop.

However, Harding (2006) stated that regardless of the different definitions of sustainability and education for sustainable development, and the lack of consensus over what the concepts mean, there seems to be general agreement that sustainability is concerned with simultaneous satisfaction of economic, environmental and social needs within the carrying capacity of natural environment. This view provides the basis for the argument of the advocates of the 'triple bottom line'.

The advocates of 'triple bottom line' argued that organisations pursuing sustainability should make decisions based on economic returns, environmental protection and social justice (Marshal and Toffel, 2005) in order to ensure sustainable development. Thus, the implementation of the triple bottom line concept requires companies to consider the societal effects of their actions (Marshal and Toffel, 2005). However, the authors argued that there is no guarantee that eco efficiency, fair trade and environmental justice if implemented by all companies, would lead to sustainability. They therefore suggested that in addition to the triple bottom line, companies should have other bottom lines beyond profit such as ethical bottom line. The triple bottom line approach is important, but going by the fact that sustainability crisis continues to increase in spite of the growing number of organisations implementing the triple bottom line concept, it can be argued that the approach has not reduced the problem. What ought to be the guiding principle of any approach attached to reducing sustainability crisis is that individuals and organisations should adopt strategies of living that allows the present generation to satisfy their needs without endangering the opportunities of the future generations to meet up their own needs. These strategies ought to be evolving with the changing dimensions of sustainability issues. This is where education as a continuing process of learning and updating strategies is suggested as fundamental to addressing sustainability crisis. The type of education that can do this ought to be transformative and global in nature.

In the view of Moore (2005, p.78), "Sustainability is a concept, a goal, and a strategy; the concept speaks to the reconciliation of social justice, ecological integrity, and the well-being of all living systems on the planet". The idea of social justice, ecological integrity and enhancing the well-being of every living thing in the above definition correlates with the definition of education for sustainable development (ESD) as provided by the Sustainable Development Education Panel of United Kingdom (1998 as cited in Aziz *et al.,* 2012). It stated that education for sustainable development help people to develop knowledge, values and skills that are useful for making decisions on how to do things either as individuals or as a group, both locally and globally. This implies that education for sustainable development (ESD) is needed as a tool to achieve sustainability, maintain and improve the quality of life of the present and future generation (Aziz *et al.,* 2012, p.514). The authors argued that if students understand sustainability as part of their social and ethical responsibility, they will be connected to the natural world and to other humans, and "besides, they will have the capacity to facilitate the development of activities that sustain rather than degrade." However,

the mere teaching of education for sustainable development at university without blending it with Whole Person Learning may not produce the desired change in learners.

Although the problem of definition is not the central issue in this discussion, the ambiguity or multifaceted meaning of the term presents its own problem. This is because if we cannot get the meaning correct, it is possible that we cannot also get the solution to the problem right. In support of this view, Ciegis, Ramanauskiene and Martinkus (2009) noted that when trying to identify the essential features of sustainable development, which would allow understanding and providing the models of the management of sustainable development, their comparison and clarification of their processes, one faces a theoretical issue with the conceptual description and assessment of sustainable development.

Similarly, just as there are controversies surrounding the meaning of sustainability, people are also at 'war' about anthropogenic climate change being identified as one of the contributing factors to sustainability crisis. It could be said that a consensus is yet to be reached on whether anthropogenic climate change exists, and even if it does, its impact on the environment is still a highly contested issue. While some people believe that one of the major causes of sustainability challenges facing humanity is caused by human activities that lead to climate change, others argue that there is no climate change taking place in the world, not to talk of it being caused by anthropogenic factors. Buttressing this view, LeFeuvre (2010) said that "Talk of global warming is nearly inescapable these days, but there are some who believe the concept of climate change is an elaborate hoax". But in the last few years, there have been a growing scientific consensus about human influence on climate and the significant risks posed by climate change for humans and non-human life (IPCC, 2007). According to Whitmarsh (2011) there is a striking degree of scientific agreement especially among the scientists engaged in research in this area that human activity is contributing to climate change. In the study conducted by Doran and Zimmerman (2008), they found that 97% of climate scientists believe that human activity is contributing to climate change. Even though climate change researchers appear to agree on the issue of anthropogenic factors causing climate change, Whitemarsh (2011) argued that "while scientific consensus and political and media messages appear to be increasingly certain, public attitudes and action towards the issue do not appear to be following suit". Explaining why the public think and talk the way they do, Whitemarsh (2011) stated that popular and academic debate often assumes the public

think and talk the way they do because they are ignorant of what climate change is all about or that misunderstanding beclouds their sense of judgement; but some studies have suggested political beliefs and values may play a more important role in determining belief versus scepticism about climate change.

Lending support to the reality of climate change, Poortinga, *et al.,* (n.d) stated that research conducted in the past (e.g. Defra, 2002; Defra, 2007; Upham *et al.;* 2009) indicated that awareness and self-report knowledge of climate change has been increasing steadily over the last 20 years; with awareness of the terms 'climate change' and 'global warming' being near universal in the UK since the early 2000s (Lorenzoni *et al.,* 2006; Whitmarsh, 2009; Whitmarsh *et al.,* 2011 as cited in Poortinga, n.d). A survey conducted in 2005 found that an overwhelming majority of the British public felt that the world's climate is changing and that they consider this as one of the most pressing environmental threats (Poortingal, Pidgeon, and Lorenzoni, 2006). However, research on public attitudes to climate change indicates that while awareness about the issue is now very high, climate change continues to be a low priority issue for most people (Upham *et al.,* 2009). This means that while many people are now aware of climate change, few of them do not consider it as a serious issue to worry about.  In support, Whitemarsh (2011) stated that the number that reject the reality and risks associated with climate change is very few. Also, Upham *et al.,* (2009) pointed out that surveys show around one in ten within the UK completely reject the notion of anthropogenic climate change. For example, in 2001, a survey conducted by government (DEFRA, 2002) found 13% agreed that "climate change is purely a natural phenomenon" while in both 2002 and 2006, polling agency MORI (Downing and Ballantyne, 2007) found 9% held this view. One BBC World Service (2007) survey indicated the proportion of 'sceptics' (i.e., those rejecting any human cause for climate change) may be as high as 17%. This is still an insignificant number compared to the percentage of people who agree that climate change is a reality and it is caused by unsustainable human activities.

But contrary to the view that climate change sceptics are very few in number, recent research suggests that scepticism and uncertainty about climate change has increased in both Europe and the US in the last few years (Eurobarometer, 2009; Department for Transport, 2010; Leiserowitz *et al.,* 2010a as cited in Poortinga, n.d). The problem this controversy over climate change could create according to Poortinga (n.d) is that when people hold climate

sceptical views, as public scepticism and uncertainty about the existence of anthropogenic climate change, it may become a major obstacle to the development of a more sustainable society. This is because "It will be a difficult task to convince the public to make sacrifices in terms of their lifestyle and to support renewable energy developments in their community if they do not believe that climate is changing or will have a real impact on their lives" (Poortinga, n.d). Agreeably, there are many details about climate interactions that are not yet well understood, and there are ample grounds for continuing research to provide a better basis for understanding climate dynamics (Oreskes, 2004). The author opined that the question of what humankind can do about climate change is still open but noted that there is a scientific consensus on the reality of anthropogenic climate change. In his words, climate scientists have repeatedly made efforts to make this clear and it is time for the rest of us to listen. Without much disagreement, scientists find human activities are heating the Earth's surface (Oreskes, 2004).

It is important to note that climate change sceptics differ in their views. Rahmstorf (2004) made a useful distinction between trend sceptics, who deny there is such a thing as an upward trend in global temperatures; attribution sceptics, who agree that the world's climate may be changing but do not feel that it is caused by human activity, and impact sceptics, who think that the world's climate is changing as a result of human activity but do not believe it will lead to substantial detrimental impacts. While one may argue that straightforward trend scepticism does not appear to be too widespread, many express some level of uncertainty about whether climate change is really occurring (Leiserowitz, Maibach, Roser-Renouf and Smith, 2010a), while some other experience some degree of ambivalence or mixed feelings (Poortinga *et al.,* 2006), or think they need more information to form a clear opinion about it (Whitmarsh, 2009). In the midst of this controversy over climate change issue, what the researcher considers to be most important is that humankind has no other place to live, at least for now, therefore our planet needs to be saved rather than put its future in the jeopardy of a very controversial debate. Interestingly, there is some recent evidence that at least in the United States of America the increase in trend scepticism has been levelling off and this could mean a return to higher levels of concern about the existence of climate change (Leiserowitz, Maibach, and Roser-Renouf., 2010b). While this debate rages on, it could be in the interest of humankind to be acting and behaving in the way that will help reduce anthropogenic climate change catastrophe if it turns out to be a reality with us as it seems now.

Some scholars are blunt in their rejection of the denial by climate change sceptics that climate change induced by human factors is a hoax. For instance, Antilla (2005) explained that one problem that is common in US media has been the suggestion that huge disagreement exists within the international scientific community as to the reality of anthropogenic climate change, but Oreskes (2004) bluntly rejected this view and described the concept as false. Supporting the view that anthropogenic climate change is a reality, Oreskes (2004) explained that "some corporations whose revenues might be adversely affected by controls on carbon dioxide emissions have also alleged major uncertainties in the science". Such statements, according to the author suggest that there might be substantive disagreement in the scientific community about the reality of anthropogenic climate change but this is not the case. Anthropogenic climate change is a reality. A scientific consensus is said to have been reached that human induced climate change is responsible for global warming.

According to Oreskes (2004), the scientific agreement is clearly expressed in the reports of the Inter-governmental Panel on Climate Change (IPCC). This is a body created in 1988 by the World Meteorological Organization and the United Nations Environmental Programme and assigned with the duty to evaluate the state of climate science as a basis for informed policy action, primarily on the basis of peer-reviewed and published scientific literature (Oreskes, 2004). In its most recent assessment, IPCC stated without mincing words that the consensus of scientific opinion is that Earth's climate is being affected by human activities: Human activities ... are changing the concentration of atmospheric constituents ... that absorb or scatter radiant energy. ...Most of the observed warming over the last 50 years is likely to have been due to the increase in greenhouse gas concentrations (Oreskes, 2004). Antilla (2005) pointed out that the efforts by some media people and elsewhere to make people believe that science of climate change is uncertain or controversial notwithstanding, a recent poll by the Program on International Policy Attitudes (PIPA) (2005) found that 73% of the US public believe that their country should participate in the Kyoto Protocol and 86% think that President Bush should act to limit greenhouse gas emissions if such action is taken by the leaders of other G8 countries. IPCC is not alone in its findings and conclusions on climate change. In recent years, all major scientific bodies in the United States whose members' expertise bears directly on the matter agreed that anthropogenic climate change is an undeniable fact; IPCC's conclusion that most of the observed warming of the last 50 years is likely to have been due to the increase in greenhouse gas concentrations correctly reflects the current thinking of the scientific community on this issue (Oreskes, 2004). Others such as

The American Meteorological Society, the American Geophysical Union and the American Association for the Advancement of Science (AAAS) all have issued statements in recent years concluding that the evidence for human modification of climate is compelling (Oreskes, 2004).

It appears that the issue of climate change has been highly politicised and some people in the business world seem to be making huge gains out of the dilemma of climate change. In support of this view, Antilla (2005) stated that the federal government of US is rejecting the challenge of anthropogenic climate change probably because powerful forces within society combine to distract both the public and policy makers from this reality. The author argued that "there is no question that certain business sectors benefit from this political impasse, the contours of which are most discernible when influential individuals publicly dispute the scientific consensus on climate change…" I share the view that climate change is a reality and that human activities contribute to the rising challenge of the 'monster'. If the controversy of climate change remains unresolved, the hope of all actors engaged in the pursuit of environmental sustainability making huge progress is in doubt, and this could negatively affect global sustainable development.

The Report by the World Commission on Environment and Development (1987) headed by Gro Harlem Brundtland (Marshal and Toffel, 2005) in an effort to link sustainability with economic development (Waddock, 2007) defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 2007). It stated that "Sustainable development is a process of change in which the application of resources, the direction of investments, the orientation of technological development, and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations" (WCED, 2007, P.46). This definition captures two important objectives of any plans aimed at creating a sustainable society. These objectives are how the present generation could satisfy their own needs and still live enough resources for the future generations to satisfy their needs. However, the Brundtland (1987) definition has been criticised by some people as being too difficult or impossible to translate into action (Marshal and Toffel, 2005). According to the authors, the critics argue that to use this definition to evaluate policy choices or business decisions and simultaneously avoid making it difficult for the future generations to meet their own needs, requires predicting both their needs and abilities, which in turn requires forecasting their

available technologies. Going by the inaccuracy of historical predictions of today's technologies, it is difficult to predict technologies several generations ahead, not to talk of predicting what the future generations will need. Thus, the Brundtland Commission's definition seems unhelpful in evaluating the sustainability implications of current decisions. What could be the more important issue to consider is how the current users of resources could be transformed to live sustainably, so that they could pass on sustainable lifestyle to the future generation and allow them to manage their own needs.

Sustainability presupposes that we should make efforts to limit our ecological footprints. According to Magala (2012), the new value of sustainability appeals to individual conscience and asks for remorse if one's consumption pattern harms the long-term ecological balance for every other person. This kind of appeal is more of an ethical issue than the thinking pattern prevalent among enterprises. In the world of business, emphasis seems to be on producing large quantity of goods for the global market place and making huge profits. Little or no attention is paid to how this approach to doing business could affect the environment and the survival of the planet. Supporting this view, Kottler (2011, p.132) stated that in the past, marketers largely held the unexamined assumptions that: "Wants are natural and infinite, and encouraging unlimited consumption is good; the planet's resources are infinite; the earth's carrying capacity for waste and pollution is infinite; quality of life and personal happiness increase with increased consumption and want satisfaction".

On the contrary, "…those who press for sustainable practices hold the following principles: wants are culturally influenced and strongly shaped by marketing and other forces; the earth's resources are finite and fragile; the earth's carrying capacity for waste and pollution is very limited; quality of life and personal happiness do not always increase with more consumption and want satisfaction" (Kottler, 2011, p.133). This latter view suggests that both individuals and businesses have to live by the principles of sustainability in order to save the earth and humanity from the consequences of unsustainable lifestyle. To do this will require transformation in the lives of individuals, groups and the public. Some companies are already doing something in line with the principles of sustainability. For example, Kottler (2011) and Magala (2012) discussed what some companies are doing to be seen as sustainable. However, no mention was made of change in attitude or transformation of learners, chief executives of organisations (CEO) and employees of organisation as fundamental to achieving sustainability. This study considers it important to talk about transformation in the attitudes

and behaviours of people because production and consumption patterns will not change without transformation in our attitudes and behaviours. Also, Kottler (2011) pointed out that companies that embrace sustainability are expected to make some basic changes in their production and marketing practices and Magala (2012) noted that sustainability requires a "harmonised and less exploitative social policies with respect to plants, landscapes, animals…," but both authors did not mention how this could be done. It is the view of this researcher that one way of addressing the issue is by using education and learning to transform the attitudes and behaviours of individuals and organisation to act sustainably. The controversy over the meaning of sustainability may not end soon because the term will continue to acquire new meanings as new dimensions of sustainability evolve.

However, we cannot continue to dissipate energy in contesting the meaning of sustainability and the reality of anthropogenic climate change while the environment and economic crisis these variables create keep claiming our ecosystem and affecting human health. What is important to bear in mind is that it is difficult to reduce world poverty and global economic recession without a transformation to sustainable living. To do so will instead of reducing poverty, it will make it worse. This is because the effects of global warming and environmental degradation and resource depletion could exacerbate poverty and endanger human health. And poverty, just as affluence impacts negatively on the global environment. In addition, sustainability crisis, poverty and human health are interconnected. Therefore, they cannot be thought of separately. Solution to the problems requires the application of system thinking. This thinking pattern links all things together in the process of making decisions and taking of actions.

Sustainability issues challenges sociologists, environmentalists and even the economists. Each of this group has been seeking for answers to the problem. Perhaps the economists could play some important role in deciding the issue. So can the sociologists and environmental scientists. For instance, economists could help in developing global poverty reduction strategies, population issues, and even climate change analysis. To this challenge, literature indicated that economists have not been out of the race in the search for solution to sustainability issue. Supporting this view, Weitzman (2007) stated that the issue of global climate change and how to tackle it has put economics to a severe test in which economists have been challenged to think afresh about how to model (or at least how to conceptualise) such fundamental notions as risk, uncertainty, and discounting.

51

Some leading economists (e.g., Stern, 2007, Nordhaus, 2007, Mendlson, 2007, and Weitzmann, 2007 as cited in Broer, 2012) have analysed the economics of climate change by assessing the scale of action required and the optimal $CO_2e$ atmospheric stabilisation levels. The analysis was aimed at finding out whether it would be cheaper to reduce emissions now or pay at some time in the future in order to adapt to a changing climate (Broer, 2012). Majority of the economists found it optimal to pursue greenhouse gas emission reduction by following a more gradualist course starting with the reduction at far lower levels than the quick and near future approach advocated by Weitzman (2007),  but which after that ramp up considerably overtime (Weitzman, 2007). Stern (2007 as cited in Weitzman, 2007, p.704) review analysis found that "the benefits of strong and early action far outweigh the economic costs of not acting", and asked for stabilizing greenhouse gas atmospheric concentrations at $\approx$ 550 parts per million (ppm) of carbon dioxide or $CO_2$ -equivalent ($CO_2e$) (Weitzman, 2007). This implied that Stern suggested immediate action and not less than 25% $CO_2e$ reduction by 2050 over the 1990s levels (Stern, 2007 as cited in Broer, 2012). Nordhaus meanwhile concluded that taking of action to reduce greenhouse gas emission was not urgent.

Stern (2007) and Nordhaus (2007) asked the question: What is the level of CO2e stabilisation levels in terms of balancing the needs of future generations with those of current generations? The search for answer to the question using analysis based on different discount rates (Figure 3.1) led to two different conclusions.
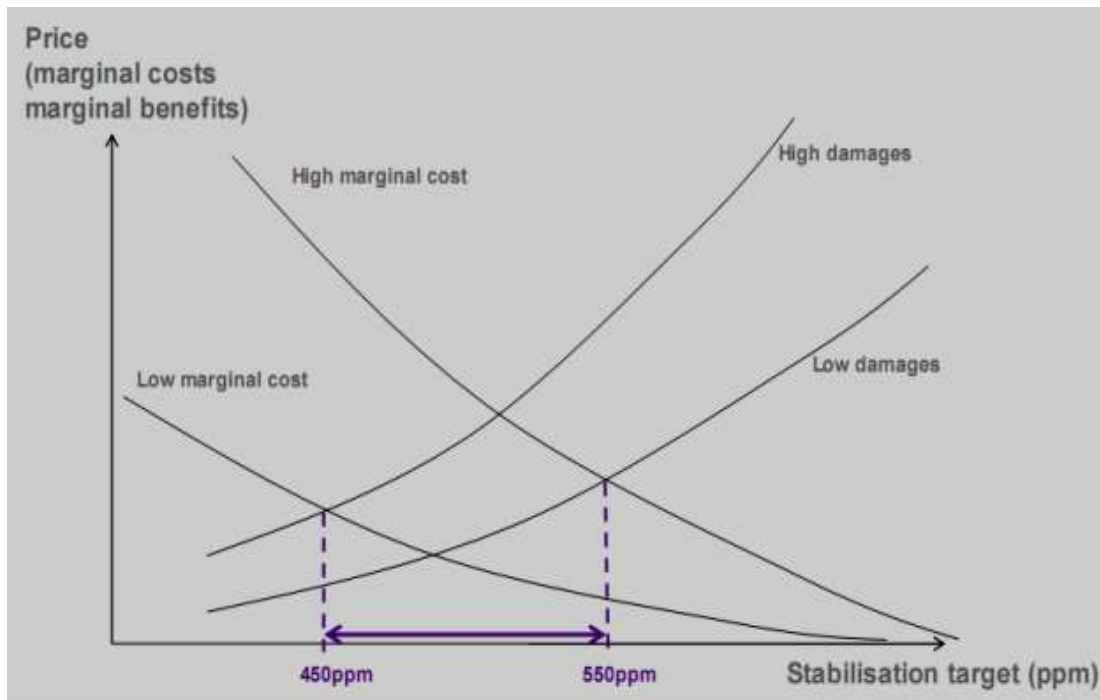
**Figure 3.1:** Finding the optimal stabilisation point, cost benefit analysis

**Source:** Hepburn, 2008 adapted from Stern, 2007 as cited in Broer, S. 2012, p.29.

While Stern (2007) 0.1% discount placed a relatively high value on the wellbeing of future generations, Nordhaus 6% discount rate placed less value on the wellbeing of future generations (Nordhaus, 2007 as cited in Broer, 2012). This analysis and the estimates of carbon emission reductions proposed by economic analysts could be helpful to some extent. However, the application of the proposals made by these economists is limited by our inability to correctly predict what could be the needs of the future generations and the level of carbon emission reduction that will be required to enable them meet their needs. Moreover, it is not only the high level of carbon emissions that is the cause of sustainability crisis. There are myriads of other factors. So, the economists need to first of all, think of sustainability in interconnected sense and not as an isolated concept.

A Problem arises when we think of human problems and global issues in a disconnected sense. Therefore, building a sustainable society will require recognising the interconnectedness between how natural resources are used, technologies employed in the exploitation of the resources and their impacts on the environment as well as the implications of the policies that drive the use of natural resources. This is because as the system thinking model indicates, the different aspects of sustainability: environment, economic and social

aspects and even the political are all interconnected (Sterling, 2011). Also, because the Earth is a system, what affects one part could affect the other parts as well. In the words of Von Schomberg (2002), the concept of sustainable development has crystallised down to three main pillars: economic development, social development and environmental protection. The connections between these three aspects require that the development perspective should take cognisance of the environmental implications of any economic development aimed at achieving economic growth and poverty reduction. The Brundtland Commission definition of sustainability adequately took care of the interconnections between the economy, environment and social justice. According to the report, sustainable development "integrates economic and ecology in decision making to protect the environment and to promote development" (WCED 1987, P.37). At each point, making connections between economic decisions and their implications on the ecology could help in creating a sustainable society.

Besides the unsustainable activities that the rural poor might engage in, it is argued that multinational corporations sometimes act even more unsustainably and help to make the rural population poorer. In the Niger Delta Region of Nigeria, the incidence of poverty is said to be very high with more than 70% living at subsistence level in rural areas, a situation that is in sharp contrast to the region's critical importance to the Nigerian economy (Uwem, 2007). The author argued that after over 40 years of oil exploration in the area, it has received little or no attention from successive administrations. But instead of the government of Nigeria accepting any blame for lack of development in the Niger Delta region of Nigeria, the different levels of government and its political elites turn round and blame multinational companies for the problem and incidence of poverty in the region (Uwem, 2007). This culture of blame has led to community protests as well as indicting statements by state governors and members of the Nigerian legislature at the local, state and federal levels (Uwem, 2007). The perceptions manifest in various kinds of protest (i.e. peaceful or violent) against the multinational oil companies organized by various groups (e.g. youths and women) within the Niger Delta communities (Frynas, 2001). The entire scenario has led to increasing national and international perceptions that the oil companies in Nigeria are massively exploiting their host communities in the Niger Delta, but giving too little or nothing in return to the people (*The Guardian*, 2002). It is a common belief among the local population of Niger Delta that the benefits of government-funded projects from oil revenues hardly reach the intended communities. More often than not, the youths of Niger Delta are aggrieved because oil spillage in the Niger Delta region has destroyed all the aquatic life and the farm lands that

support the life of the farming population in the area, and that the Niger Delta environment has suffered degradation resulting from gas exploration, water pollution and land degradation from oil spillage, gas flaring and canalization all of which impacts negatively on people who depend on environment to eke out a living (Eregha and Irughe, 2009).

On the other hand, because of the slow level of development in Nigeria and the high level of unemployment in the country, the youths of Niger Delta seem to rely on the supports that could come from the big oil companies such as Shell to enable them live above poverty level. Supporting this view, Ite (2004) noted that the failure of the Nigerian government to provide and actively encourage social and economic development in the Niger Delta, or anywhere else in Nigeria, has led to the reliance (directly and indirectly) by the government and the Niger Delta communities on the multinational oil companies. But in the view of the researcher, the oil companies cannot be held wholly responsible for the poverty and low level of development in the Niger Delta region. This is because there are other factors that contribute to making people poor not only in the Niger Delta region but also in every other part of Nigeria and beyond and these factors are also present in the Niger Delta region of Nigeria. For instance, corruption is s social problem that has eaten deep into the fabric of Nigerian society. And of course, no country in the world is free from corruption. This means that even when the multinational companies make efforts to provide for their host country, comply with the regulations and guideline the host government wants them to follow, some corrupt powerful members of the society circumvents this plan, and divert funds meant for poverty alleviation to satisfy their selfish and personal interests.

As noted by Uwem (2007) the oil companies are aware that they need the social licence to operate, especially in a conflict zone like the Niger Delta, and have accordingly increased the level of their corporate social responsibility (CSR) activities since the late 1990s. For example, in its exercise of its corporate social responsibility, Shell has been involved with the development of the communities in the Niger Delta since 1937; in the 1960s, the company supported efforts aimed at improving the livelihood of the largely agrarian communities of the region and in 2004, Shell began the implementation of the 'sustainable community development' strategy, in its quest for, and journey towards, sustainable development in the Niger Delta (Uwem, 2007). These actions taken by Shell is in line with the view expressed by World Conference on Environment and Development, WCED (1987) that sustainable development must be understood as a type of development which aims to integrate

production with resource conservation and enhancement and links both to providing an adequate livelihood base and equitable access to resources. The actions of Shell suggests that multination oil companies are not just out to destroy the means of livelihood of the rural poor host regions but also engage in corporate social responsibilities aimed at poverty alleviation. However, because these organisations are understood to be profit-oriented businesses, it could be difficult for the host communities to consider the efforts of the companies to improve their welfare as enough compared to the profits the companies are making, hence the unceasing crisis in such regions. Therefore, for a peaceful co-existence of oil companies and their host communities, I suggest that multinational companies should adopt integrative approach: ensuring that their operations are in line with the principles of sustainability and the promotion of human welfare.

Underscoring the importance of integrative approach as a way of addressing sustainability problems, Dover (2005, p.1) noted that it is widely perceived that integrative approaches are needed to address problems in environmental management so as to achieve sustainable development. Supporting the view that sustainability can only have a complete meaning if the economic, social and environmental dimensions are taken into account, Kaufmann-Hayoz and Gutscher (2001, p.1) stated that sustainable development is to be understood as a three-dimensional normative concept:

**i.** The ecological dimension is concerned with preserving natural life support systems by improving the quality of the environment, reducing pollutions for the future generations and using resources in sustainable ways.

**ii.** The economic dimension aims at ensuring economic prosperity through effective use of resources, providing people with employment, good income, and making technological progress.

**iii.** The socio-cultural dimension aims at resolving social justice and solidarity by promoting a just distribution of wealth and income, ensuring education, legal rights, cultural identity and diversity, and so on. However, Kaufmann-Hayoz and Gutscher (2001) failed to mention the need for developing the political will to take sustainability into account during policy making as well as the implementation of measures that can enhance it.

It seems that instead of engaging in integrative approach as the way to creating a sustainable environment, there is a move towards achieving technical solution to the problem. In the view of the researcher, even with respect to the highly industrialised nations of the West often

accused of contributing high level of greenhouse gas emissions that cause environmental problems and climate change, it could be said that it is not finding technical solution to the problems that matters. The need to see sustainability problem from a less fragmented point of view could be more important than all the technical innovations aimed at reducing sustainability crisis. In this sense, the West needs to consider ecological aspect of sustainability as of equal importance to the economic and the social aspects. In support, Kaufmann-Hayoz and Gutscher (2001, p.2) suggested that "From global perspective, the western industrialised nations have to improve first of all in the ecological dimension", However, he noted that in the long run, sustainable development will only be possible if socio-cultural and economic conditions are also taken into consideration.

Wals (2009) defined education for sustainable development (ESD) as "a learning process (or a teaching – training approach) based on the ideals and principles that underlie sustainability and is concerned with all levels and types of education". This definition suggests that sustainability should be reflected in all types of education, formal and informal and should also be considered at all levels of education. So, both formal and informal education contributes in one way or the other to education for sustainable development. At university level, it is widely acknowledged that "…the main contribution of a University to sustainability is the provision of Education for Sustainable Development (ESD) to local actors" (Karatzoglou, 2012, p.45). By implication, universities engage in education for sustainable development as a planned method of enhancing sustainability. As a result, education for sustainable development could be said to be fast developing at global level as the most effective approach to transforming the world to a sustainable place for human habitation and as a safe habitat for both plants and animals. In relation to transformation of humankind, this evolving approach to sustainability is aimed at transforming learners to live sustainably by using ESD to make learners gain transformative experience involving expansion of the learners' perception, action use of content or the capacity to act on an idea. This transformative experience which in the words of Pugh (2011), represents a form of engagement, with acting on an idea, expansion of perception, and value development, roughly reflecting the behavioural, cognitive, and affective dimensions respectively, should be the major objectives of transformative education for sustainable development. In the process of learning how to live sustainably, the transformation of the learners' behaviours and attitudes towards the environment cannot be ignored. Hence, sustainability education seeks to develop learners' knowledge and their understanding of sustainable behaviours and actions.

## 3.4 Transformative Learning

Transformative learning is a learning process that leads to revision of the beliefs and assumptions of an individual in such a way that the person begins to perceive life in a more concrete form. Transformative learning prepares learners to interpret experiences in a new way that could lead them to taking of right actions. O'Sullivan (2002 as cited in D'Amato and Krasny, 2011) stated that transformative learning occurs when we can no longer interpret our current experience based on our old assumptions, and our cognitive system then searches for ways to reorganise until new constructs are discovered that make the novel and confusing perception intelligible. This disconnect between construct and experience makes "living systems adapt by transforming themselves, and learning occurs" (O'Sullivan 2002, p.3 as cited in D'Amato and Krasny, 2011). In agreement with this view, Glisczinski (2007) argued that this form of learning has the potential to transform worldview and behaviour, and transformative educational experience can make it possible for higher education to actualise its mission of the search for truth and pursuit of meaning into reality.

The outcomes of transformative learning are important for the development of sustainable values in the life of the learner. Transformative learning results in the development of competence in an individual to integrate, connect, confront, and reconcile many and different ways of looking at the world and the need for learners to be able to cope with uncertainty, poorly defined situations, and conflicting or at least diverging norms and be able to change or shift perspectives to accommodate new conditions that arise as time changes (Svanstrom, Garcia and Rowe, 2008). The authors stated that the indicated transformation in the learner is achieved when the learner goes beyond factual and instrumental learning and are changed by what he or she learns. This form of change does not come by easily. It could take some time for what an individual learned to bring about transformation in the lifestyle of the individual. Supporting this view, Krause (2013) stated that the pedagogical wing of global education emphasises that fundamental changes in learners take time and needs carefully conceptualised long-term learning process. Although achieving changes in learners could take time, it is possible that when the change is finally achieved, it could be a lifelong change. Mezirow (1991a) stated that adult development as a process of transformative learning is "irreversible once completed; that is, once our understandings clarified and we have committed ourselves fully to taking the action it suggests, we do not go back to levels of less understanding. I share the view that once transformation has taken place in a person's life, the

individual does not relapse back to the former way of living and acting. However, this depends on several variables that influence human behaviour. Sometimes, the type of education that a person is exposed to and the context in which the education takes place could influence the behaviour of an individual that has undergone a 'first degree' transformation in one culture and latter exposed to a new cultural context where the education, social and economic perspective of the people disorient the individual. But if a person has undergone a complete transformation in which case, the old life in the individual is dead and the new way of living is the product of spiritual rebirth which could be called 'third degree' transformation, such transformation could be irreversible.

Transformative learning makes learners to reflect upon issues, and draw vital lessons from experience before taking action. It is defined as the process of examining, questioning, validating and reconstructing ones perceptions of the world (Cranton, 1994 as cited in Henderson, 2002). According to Henderson, (2002) people who experience transformative learning are aware of doing so, and others can also recognise that transformation has taken place in those people. For example, a racial prejudiced individual who through transformative learning comes to value and respect people from different races not only perceives this fundamental change of perspective but is seen to have undergone fundamental change by others. Individuals experience transformative learning as a result of passing through certain experiences, critical reflection and engaging in dialogue.

The factors that lead to transformative learning have been linked to learning. Education theorists such as Dewey, Levin, and Piaget advocated that learning is dependent on the integration of experience with reflection and theory with practice (Imel, 1992). Although these theorists argued that experience is the basis of learning, they maintained that learning cannot take place without reflection. Supporting this view, Henderson (2002) said that transformative learning has its roots in constructivist learning theory which states that "learning is a process of constructing meaning; it is how people make sense of their experiences" (Merriam and Caffarella, 1999, p. 261 as cited Henderson, 2002, p.201).

**3.4.1 Experience:** The experiences of learners in their journey through the challenges of life form the starting point for transformative learning. When learners come to the realisation that their experiences of reality in their struggles to solve their personal or collective

problems indicate that they cannot confront the contradictions with the assumptions and ideals they hold, they begin to think of change. However, there are times when it is traumatic experiences that learners pass through that form the starting point of transformation. Supporting this view, Mezirow (1995) and Lynette (2009) stated that the starting point and central matter for transformative learning is the learner's experience.

Experience is the product of accumulated knowledge that an individual gathers in the process of attempting to find solutions to the contradicting challenges of his/her expectations in life. As a learner gathers experience, the person learns from the experiences. Based on accumulated experiences, the individual's meaning perspective could be transformed and he or she begins to look at realities surrounding him/her differently. Mezirow (1998, p.7) contended that "Meaning perspectives operate as perceptual filters that organise the meaning of our perspectives." Meaning perspectives are changed when there is a change in the meaning schemes of the learner. This implies that when perspective transformation takes place, there is a change in the meaning scheme which leads to developing new ways of solving problems. According to Mezirow (1998, p.167), "Perspective transformation is the process of becoming critically aware of how and why our assumptions have come to constrain the way we perceive, understand and feel about our world; changing these structures of habitual expectation to make possible a more inclusive, discriminating and integrating perspective; and finally, making choices or otherwise acting upon these new understanding".

The implication of perspective transformation in adult learning is that it leads to change in how adults view the world. This change in world view occurs because the change in perspective alters meaning structure. These meaning structures are frames of references that are based on the totality of a person's cultural and contextual experiences and that influence how the person(s) behaves and interpret events (Taylor, 1998 as cited in Imel, 1998). It can therefore be argued that transformation occurs when there is a change in the meaning schemes of learners which in turn leads to a shift in the prior experience of learners. However, this shift does not take place in isolation of the old experiences. Rather, the shift comes about from the reassessment and reinterpretation of the old experiences. Thus, new knowledge is developed from the old and existing knowledge. This means that there is always a link between what the learners know and what they come to know. So, experience

count in the development of new attitudes, values and actions since it is the existing attitudes and values that are transformed.

The acquisition of experience comes in various ways. It can come through education and learning. In this regards, account of the experiences of individuals as documented in books or explored in the process of classroom teaching enriches the learners' experience and can influence the development of new skills and ways of tackling problems. Experience can also be gained from informal education such as knowledge imparted on children by parents. Supporting this, Lynette (2009, p.70) stated that "Our experiences, which guide our behaviours and actions, are acquired through socialization and acculturation with parents, teachers, and others and influence our meaning perspectives".

**3.4.2 Reflection:** Reflection on one's assumption is an important stage in the process of transformation. Reflection on experience before taking action helps the learner to avoid previous mistakes when he/she engages in any new approach to problem solving. In support, Healey and Jenkins (2000) said that if students do not reflect on experience, they face the danger of continuing to make mistakes. A new approach to problem solving usually results from the change in the learners meaning scheme, and a change in meaning scheme cannot occur without critical reflection on the learner's experiences. In support, Mezirow (1991) said that for a change in the meaning schemes (specific beliefs, attitudes and emotional reactions) of learners to occur, learners must engage in critical reflection on their experiences which then leads to perspective transformation. This implies that reflection alone is not sufficient to bring about change in the attitudes and behaviours of an individual. This is because reflection is not deep and emotional enough to course a shift in consciousness that leads to change in attitudes and behaviours. Supporting this view, Imel (1992) stated that reflection does not address personal issues such as values, beliefs, and it is possible that reflection can result in superficial and short-lived changes to practices. The author said that it is an internal process known as reflexivity, or critical reflection that addresses the issues of values and beliefs and matters that need personal evaluation of ones assumption for a change in practices to occur.

Critical reflection refers to questioning the reasonability of assumptions and beliefs based on previous experiences and usually occurs in response to an awareness of a contradiction among our thoughts, feelings, and actions (Taylor, 2010). Critical reflection is a conscious

and explicit re-evaluation of the consequence and origin of our meaning structures (Taylor, 2008). According to Mezirow (1995 as cited in Taylor, 2008, p.6), critical reflection is a process by which we attempt to justify our beliefs, either by rationally examining assumptions, often in response to intuitively becoming aware that something is wrong with the result of our thought, or challenging its validity through discourse with others that have different viewpoints and arriving at the best informed judgment. Critical personal reflection or personal reflexivity (the process whereby we engage our minds in self-questioning, examining our values, interests and beliefs in life and identifying our social identities in the process of exercising critical consciousness) leads to a lasting transformation in our ways of living and doing things (Imel, 1992).

Critical reflection is a process that goes on in the mind. It has the power to build up new knowledge in an individual. It can as well lead to irreversible decision once the individual involved is convinced that prior assumptions are wrong. By implication, critical reflection is a process of transformative learning and it occurs in the mind of an individual. However, Donaldson (2009) stated that people have argued that much of the transformative learning occurs in the heads and hearts of individuals.

Underscoring the importance of critical reflection in the transformative process, Taylor (2010) said that with regard to transformative learning, most important to effecting change in one's established frame of reference (world view) is the critical reflection of assumptions (CRA). Critical reflection engages the learner in a dialogue between the head, the mind and the body. When somebody is reflecting on experience, the individual engages in a kind of meditation. At this level, the person could gain a deeper understanding of the problem situation. In the process, the individual can develop more ideas that could help him/her to think in a more inclusive way. Supporting this view, Belenky and Stanton (2000, p. 74) stated that "not only would participation and reflective dialogue support [students'] development as individuals, it could also support the development of a more inclusive, just, and democratic society".

Transformation in the life of an individual does not occur automatically. Even after experiencing a crisis situation, a person does not automatically get transformed until the individual involved has reflected on the situation or issue and questioned the essence of living a lifestyle that does not guarantee a better future. In support of this view, Svanstrom, Garcia

and Rowe (2008, p.343) argued that "In order to achieve transformational learning you must critically reflect on your knowledge and experiences, continuously question your assumptions, beliefs and values, and act accordingly in your personal life, professional life and community life". Critical reflection enables us to question our understanding of specific event and also to challenge our core beliefs. Lynette (2008, p.70) agreed with this view when he stated that "Critical reflection enables the adult learner to examine and reframe one's experiences by questioning the integrity of beliefs, values, and assumptions held based on prior experiences." In this capacity, critical reflection serves as a process of initiation into a deeper level of thought that helps the individual to consider the available options of living and to choose from the options, the way of living that is better and more sustainable than the previous way of living. Through critical reflection, we become aware of the shortcomings of our beliefs and assumptions. When this happens, we begin to critique such beliefs. This personal critiquing of beliefs indicates our readiness to change. Lynette (2008) stated that this is vital for the transforming of our meaning structures which is perspective transformation. Studies by Ziegahn (2001 as cited in Lynette, 2008) supported Mezirow's (1998) theory that reflection on personal experience is empowering for learners because they confront the contradictions of everyday life.

However, it is difficult for a person to reconsider personal assumptions and beliefs without the involvement of peers. This is because no one can be his own judge. Therefore, personal reflection requires that we involve peers that provide us with the assessment of how our assumptions and behaviours look like. In the words of Brookfield (2009) people understand their assumptions better and have correct evaluation of what they think about themselves if they bring in peers as critically reflective mirrors to tell them how their practice look to others. The author argued that only very few people can assess their assumptions on their own, and that "no matter how much we may think we have an accurate sense of ourselves, we are stymied by the fact that we are using our own interpretive filters to become aware of our own interpretive filters". However, some friends could give a deceptive judgement of any change in the behaviour of their friend. A misleading judgement from peers can be catastrophic and worse than self-appraisal. However, this does not rule out the importance of informal ways through which one can improve on reflective practices. An individual can reflect on experiences without going through any structured course. In this regard, Boud (2001) explained that reflection can be undertaken as an informal personal activity for the sake of reflection.

At personal level, the researcher has engaged in reflections at formal and informal levels. This led to the researcher's development of new ways of relating with the environment. The development of new way of living occurred as a result of reflection on past experiences and engagement in dialogue with colleagues. This reflective action resulted in change in perspective, behaviour and actions of the researcher with regard to environmental sustainability. The change in perspective and actions made the researcher to realise that it was an ethical responsibility to live by the principles of sustainability in order to make the world a better place to live. The researcher became mindful of his actions and their impacts on the environments. It is the researcher's belief that the transcendental transformation towards sustainable living that occurred in his life was the direct outcome of reflection and dialogue. While reflection was purely personal, taking place in the researcher's life when alone, engagement in a dialogue with others occurred mostly during social interactions. Dialogue also occurred within self. Thus, it was self-reflection and dialogue within oneself and those with others that transformed the researcher and made him become mindful of his actions and their implications. This suggests that when reflection and dialogue work together in an individual, they produce a person that is mindful. In the process, reflection and dialogue amplifies each other. In support of this view, Hays (2013, p.1) stated that "Combining Dialogue, Reflection, and Mindfulness permits a synergy that amplifies the impact of any one of the elements operating singly". Being in the midst of students from different cultural backgrounds is like being part of a multicultural team. In such a team, dialogue, reflection and mindfulness as illustrated in Figure 3.2 are important for the development of new attitudes and behaviours.
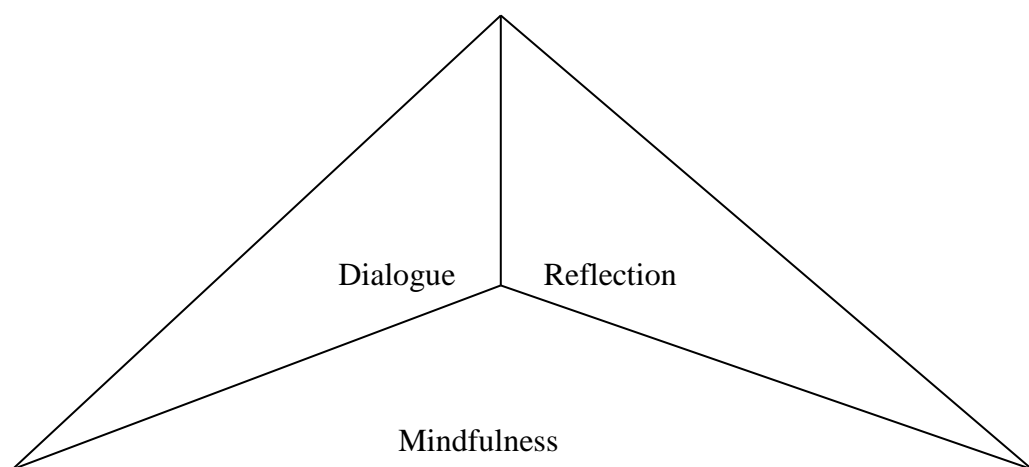


**Figure 3.2:** Team Learning Pyramid

**Source:** Hays, J. M. 2013, p.1

Mindfulness refers to an increased awareness of and enhanced attention to current experience or present reality (Brown and Ryan, 2003 as cited in Thomas, 2006). It is the opposite of mindlessness, meaning that the mindful individual is acting with reason and understanding of the implications of his or her behaviour (Hays, 2013, p.5). According to Thomas, 2006 as cited in Hays, 2013), people who are mindful know what is going on within and around them. This means that a mindful person is fully aware of current condition, and does something to address the situation (Rays, 2013). Thus, mindfulness is an important process that links knowledge and action (Thomas, 2006). Mindfulness make people to see, hear, and feel things that they would otherwise not care about, and this implies that mindful people have access to richer and more complete information (Hays, 2013). They see the situation for what it is, and better understand the context in which it has arisen. Because being mindful is an important step to taking action, it is a key factor in fostering transformation of an individual towards sustainable living.

In their relationship, reflection is connected to prior experience, and acting together with dialogue or singly, it makes one to become mindful of one' action. Reflection, dialogue and mindfulness can also take place within a group. Within a group, participants in group learning or activities, reflect on issues that are significant and through the process of dialogue and discourse, they arrive at new knowledge that leads to change in the old ways of doing things. This change occurs where the new way of doing things is analysed to be better than the old way(s). The participants in such dialogue and discourse undergo perspective change informed by their new and better ways of doing things and the sharing of experiences. In agreement with this view, Tennant (1991 as cited in Taylor, 2010) stated that learning experiences, especially when it is shared, establish a common base from which each learner constructs meaning through personal reflection and group discussion.

**3.4.3 Rational Discourse:** Education and learning often engages learners in rational discourse. This type of discourse is different from ordinary discussion with others. In contrast to everyday discussions, rational discourse is used when people have reason to question the comprehensibility, truth, appropriateness (in relation to norms), or authenticity (in relation to feelings) of what is being asserted (Mezirow, 1998; Mezirow, 1991 as cited in Taylor 2008). The process is different from everyday discussion. The questioning of the validity of what is being asserted could lead to either holding on to the old view or searching for an alternative

view that is better than the former. Where the result is the search for alternative view, it kick starts a new way of seeing things. As the members in a discourse team share their knowledge, experiences and assumptions objectively, individuals in the team could see the needs for a change in their ways of thinking and lifestyle. Thus, it can be said that rational discourse leads to the reframing of our frame of reference and this invariably leads to perspective transformation. In support of this view, Taylor (2010) opined that rational discourse is important for the promotion and development of transformation.

Rational discourse provides learners with the opportunity for critical reflection on their experiences and to question their assumptions and beliefs which leads to the transformation of their meaning schemes and meaning structures (Taylor, 2010). Although the author argued that rational discourse is not an everyday type of discussion, my personal experience with learners showed that there are many discussions amongst learners that are not formally classified as rational discourse but on the basis that it satisfies the conditions of rational discourse in transformative learning as stated by Taylor (2010), I consider them as rational discourse. These conditions are that such discussions help to create understanding of others; thrives on objectivity; the actions and statements of the discussant are open to question and discussion and understanding of points of view of each contributor is arrived at through the strength of the evidence and supporting argument provided by the individuals pushing for the acceptance of a particular point of view and the central goal of such discussion is often to promote mutual understanding among others (Taylor, 2010).

## 3.5 Processes of Transformation towards Sustainable Living

Transformation in attitudes and behaviours is something that comes about when an individual, government or leaders of organisations begin to think in a new way that could help them to see the need for change. Transformation is taking place in different part of the world. For instance, Roseland (2005) stated that "a quiet transformation is taking place in communities all over North America and around the world". This indicates that individuals, government and businesses in different countries are beginning to embrace new way of thinking. In support, Roseland (2005) stated that thousands of citizens and their governments are embracing a new way of thinking and acting with a view to creating a better future. The reasons for embracing this new pattern of thinking according to the author vary but they

include a desire to improve the quality of community life, protect the environment, and take part in making decisions that affect us; concern about poverty and other social conditions, whether in faraway countries or in our own towns; longing for a sense of satisfaction that money cannot buy; and pride in the legacy left for our children. However, it is incomprehensible to argue that individuals, organisations and governments of different countries have begun to embrace a new way of thinking towards sustainability when we are still experiencing a surge in sustainability crisis caused by human actions. Can it be substantiated in any way that the teaching and learning at our higher education take learners through transformative learning processes that lead to change in attitudes and behaviours towards sustainable living?

Transformative learning is a process in adult learning where meaning making becomes continually more clarified although it does not have to follow clearly defined steps or stages (Taylor, 2010). Mezirow, 2000; Cranton, 2002; and Gravett, 2004 cited in Peterson and Gravett, 2009) described the processes that shape transformative experience as:

- A triggering event (disorienting dilemma) which makes a person to become aware of inconsistency among thoughts, feelings, and actions, or a realisation that former views and approaches to problem solving no longer appear adequate, resulting in the experience of imbalance.
- Identification of previous interpretations or views (assumptions, perceptions and presumptions) that are held unconsciously.
- Questioning and examining of held views, and the context that shaped the views and the implications of holding such views.
- An engagement in reflective and constructive dialogue (discourse) during which alternative ways of looking at things are explored and evaluated.
- A revision of views, which sometimes include broad perspectives, to make them more discriminating and justifiable.
- Action following from the revision of views.
- Development of competence and self-confidence in new roles and relationships.

Peterson and Gravett (2009, p. 102) argued that a course that is designed to engage learners in "this critical exploration generally triggers a feeling of disequilibrium that makes learners

susceptible to new ideas". Thus, transformation begins to occur in a person's life when there is a crisis that challenges the person to rethink his or her way of living. At personal level, such crises include loss of one's job, the death of a loved one or a person's sponsor and so on. This sort of crises that cause an individual to grief over his/her experience and loss and seek for a new way to survive the future is what Mezirow (2009) called disorienting dilemma. Also, social issues like a student entering into university for the first time and meeting with people from different cultures could cause disorienting dilemma.

Originally, Mezirow (2000) identified transformative learning experience as having ten phases upon which other ideas of transformative learning processes have developed. However, Herbers (1998 as cited in Glisczinski 2007) condensed Mezirow's ten phases of perspective transformation processes into four: disorienting dilemma, critical reflection, rational dialogue and action. These four phases cannot be said to be comprehensive enough to represent Mezirow's 10 steps phases. This is because some important phases like acquisition of knowledge and skills for implementing one's plans, planning of action before provisionally trying out of new roles highlighted in Mezirow's 10 steps are not accommodated in Herbers (1998) condensed four phases. However, the four phases adequately represents the components in Kolb's (1984) learning theory. Kolb's theory of learning is made up of cycles of concrete experiences, reflection, abstract conceptualisation, and active experimentation which are critical to transformative learning. In fact, Kolb (1984), Mezirow (2000), and Herbers (1998) seemed to be addressing the same point, that reflection, dialogue and renewed action, which is informed, reformed, tempered, and redirected by experience and expanding awareness are vital transformative learning processes (Glisczinski, 2007).

The learning theories that emphasis transformative learning confirms the proposition that education and learning that is transformative can expand learners' consciousness and make them to develop more accommodating views (e.g. Mezirow, 1975 transformative learning theory). This enlarged view is required to bring a shift in learner's way of thinking or consciousness. In support of the role of transformative learning in the life of a learner, Bloom's Taxonomy of learning, Fink's Taxonomy of Significant learning and Transformative learning theory as stated in Tello, Swanson, Floyd and Caldwell (2013) explained that transformative learning results in change in behaviour and attitudes or a shift

in consciousness of the learner. Learners gain meaning and insight about reality surrounding their living when education and learning goes beyond mere transmission of knowledge. Transmisive education is informative. It does not engage the students in deep learning that could lead to conscientization of the learner as transformative education could do. Supporting the view that transformative education leads to conscientization of learners, Friere (1970 as cited in Fullerton, 2010) said that educational encounter leads to conscientization which takes place when learners not as recipient but a knowing subjects, achieve a deepening awareness both of the socio-cultural reality which shapes their lives and their ability to transform that reality. He argued that becoming more aware of one's situation involves moving from the lowest level of consciousness where, there is no comprehension of how forces shape one's life, to the highest level of critical consciousness.

At critical consciousness level, the learner engages in critical reflection that is marked by thorough analysis of problem, self-awareness and self-reflection (Fullerton, 2010). This means that at the level of critical consciousness, there is a shift in consciousness that learners undergo that leads to their realisation of the meaning of life (transformation). Transformational process affects the cognitive, affective, behavioural and spiritual dimensions of the learner's life. This results in the transformation of the learner's mental process that further enhances the capacity for critical reflection. An example of transformation of mental capacity associated with cognitive development in response to and working through the mental exigencies of modern life, was described by Elias (1997, pp. 3-4 as cited in Taylor 2010, p.11) thus:

> First, is the development of "conscious I" capable of exercising critical reflection. Second is a transformed capacity for thinking, transformed to be more dialectical or systemic, thinking (for example) that perceives polarities as mutually creative resources rather than as exclusive and competitive options and that perceive archetypes as partner for inner dialogue. Third is the capacity to be a conscious creative force in the world, as expressed, for example, as the capacity to intervene in and transform the quality of discourse in a group or learning community.

Critical reflection could result in perspective transformation involving a change in the way we see things and our relationship with them. Perspective transformation takes place at

conscious level. The person being transformed is aware of what has taken place because it is the product of critical reflection, grief and change. However, this type of transformation cannot be said to be disconnected from some deeper and more rooted spiritual being of a person. This is because there is always a connection between the physical and the spiritual or metaphysical part of being for a totalising and sustainable transformation to take place. The head reasons out the need for transformation and this is reflected upon in the mind which is the spiritual and the change that results is manifested at physical level by the actions the individual takes. These connections between the head, the mind and the body are systemic. Supporting this view, Baring (2010) stated that there is a new understanding of the work of nature and how two or more dimensions of reality interact with each other that may help us modify the deeply entrenched belief spirit and nature that are separate and distinct and may at last, restore to us our lost sense of relationship with a sacred Earth and a conscious universe. It can therefore be argued that transformation towards sustainable living takes place at both conscious and unconscious levels, with one connecting the other at non-linear level to produce sustainable actions.

The new and deeper understanding humankind are gaining about the relationship between the conscious and the unconscious, the spiritual and the physical part of our being and how these interconnections shape human behaviour is partly enhanced by learning that takes place at both formal and informal level. At formal or informal level or both, adults learn what make them think differently. At adult stage of development, meaning perspective begins to change and we come to the realisation that we cannot continue to live the way we did when we were young. This process of becoming critically aware of the need for change in human behaviour to begin to think and behave like adults initiates transformational behaviours and attitudes that lead to perspective change in the learner. Supporting this process of transformation, Mezirow (1978, p.101) argued that at adult stage of life, "We learn to become critically aware of the cultural and psychological assumptions that have influenced the way we see ourselves and our relationships and the way we pattern our lives." The processes of change are captured in Kolb's (1984) cycles of learning theory and Mezirow (2000) perspective transformation theory. Kolb's (1984) experiential learning cycle emphasised a holistic process and showed that, "people take in information through some mix of concrete experience or abstract conceptualisation, and they transform that information through some mix of reflective observation and active experimentation" (Marsick and Maltbia, 2009, p.164).

Although gaining concrete experience and putting such experience into action are two different things, an individual can learn things that can transform his/her way of living from experience. When a person reflect on the different experiences or what Pugh (2011) called an experience, there is the likelihood that the individual could be transformed to live sustainably. Pugh (2011, p.110) supported this view when he said that: "An experience is transformative in that it involves an expansion of one's perception of the world. This expansion of perception is accompanied by a related expansion of value. Individuals attach new significance and meaning to those aspects of the world more fully perceived. They appreciate them more, care about them more, and have more of an emotional… attachment to them". Therefore, there is a relationship between the experiences one gains as he or she passes through different stages in life and different learning experiences. Experience gained in the classroom either confirms or disconfirms prior experience. If there is confirmation, the gained experience is considered worthwhile idea to be continued. Worthwhile ideas are ones that reconstruct the world we inhabit and open up new experiences for individuals and communities (Pugh, 2011). Such ideas provide a meaningful, new way of seeing the world, makes human understanding of some objects, events and issues clearer, and when it helps create an expansion of perception, it could lead to realising what is anticipated, and the experience reaches a consummation (Pugh, 2011). This implies that an experience is transformative and that learning transforms experience.

As explained by Kolb's (1984) experiential learning model which described a process of creating knowledge through the transformation of experience, proposed that knowledge is acquired from the combination of grasping and transforming of experience (Kolb 1984 as cited in Kolb, Boyatzis, and Mainemelis, 2000). The experiential learning model shows two dialectically related ways of gaining experience -- Concrete Experience (CE) and Abstract Conceptualization (AC) -- and two dialectically related methods of transforming experience -- Reflective Observation (RO) and Active Experimentation (AE) (Kolb, Boyatis, and Mainemelis, 2000). In learning process, the definition of learning theory stated that learning is "the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience" (Kolb 1984, p. 41 as cited in Kolb, Boyatzis and Mainemelis, 2000, p.2). Learning could be formal or informal. Both forms of learning could lead to the transformation of experience. The

experience that is transformed could be the old assumptions held by the learner which guide the learner's behaviours and actions towards others and the society. It could as well be the experience that the learner gains as he/she passes through different stages of life and which also shapes the learners relationship with all other things. This latter form of learning which is also called experiential learning is in itself transformative.
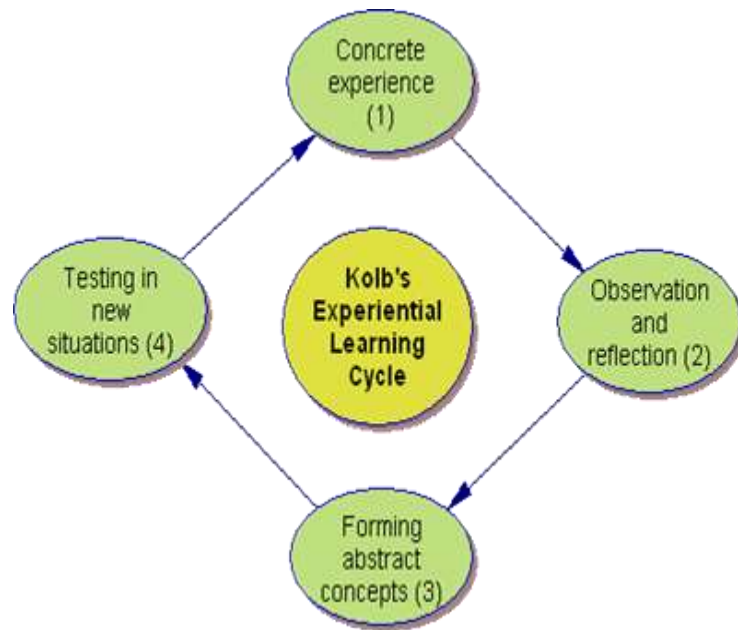


**Figure 3.3:**    Kolb's Experiential Learning Cycle.

**Source:** Learning theories.com

According to Kolb, Boyatzis and Mainemelis (2000) the immediate or concrete experience form the basis for observations and reflections and the reflections are assimilated and distilled into abstract concepts from which new implications and actions can be drawn and actively tested and used as guide in creating new experiences. These implications can be actively tested and be used as guides in creating new experiences (Kolb, Boyatzis, and Mainemelis, 2000).

Kolb's experiential learning theory argued that learning is a cognitive process which entails constant adaptation to, and engagement with, the learner's environment (Bergsteiner, Gayle and Neumann, 2010). What drives learning are the conflicts, disagreements and differences that occur as learners move through different levels that involve action, reflection, feeling and thinking all of which result in individuals creating knowledge from experience and not just

from received instructions (Bergsteiner, Gayle and Neumann, 2010). Thus, it could be argued that learning is not a linear process but involves reflections that take one back and forth evaluating the implications of what is learnt. In support of this view, Brill (2010) argued that the stages of learning as explained by Kolb's learning cycle involves a back and forth movement and mutually interdependent relationships where the four variables are mutually interdependent. In this experiential learning theory where each phase potentially leads to another and builds upon the former, "critical thinking and reflection may refine ideas or leads the individual to consider alternative possibilities" (Brill 2010, p.53) which could reshape the unsustainable ways of living that previously formed the lifestyle of the learner. In this way, "Experiential Learning Theory (ELT) provides a holistic model of the learning process and a multi-linear model of adult development, both of which are consistent with what we know about how people learn, grow, and develop" (Kolb, Boyatzis and Mainemelis 2000, p.2).

However, while the stages a learner passes through in the development process is not linear process, the transformation that occurs in the learner's life as a result of his/her passing through these processes could be said to be linear and therefore irreversible. It is linear and irreversible in the sense that once transformation takes place in the life of an individual, a third order learning has occurred. Third order learning takes the learner to a deeper level of life where the learner begins to see things differently; is creative and involves a deeper awareness of alternative worldviews and ways of doing things (Sterling, 2011). Learning that engages students in third order learning enables students to critically reflect on any feelings, ideas and thoughts before taking decision that result in taking action. Critical reflection - that is reflection that helps identify underlying values, beliefs, and assumptions – is important because it enables people to see how they can change a situation by changing the way they frame it and act on it (Marsick and Maltbia, 2009, P.161).

For a student involved in tutorial that prepares him/her to develop critical mind needed for identifying a problem, my personal experience showed that the identification stage or the stage at which the learner gains what Kolb (1984) called concrete experience can take place in the first two months of learning. Confronting the problem and finding solution to it could take place between four to five months and by the sixth month of learning and exposure to the issue, transformation of attitude and integration of new perspective start taking place. This implies that it is possible for a student at university to gain transformative experience

within the first six months of engaged learning. At this stage, the students have begun to develop critical thinking needed for finding solution to problems.

If transformation must begin in one's life, one has to let the old personality undergo the processes of death and rebirth. This is the preparatory stage for transformation. Nobody can move into new way of living while still anchored to old expectations. He must be symbolically expelled from everyday life or blindly driven by the inarticulate sense that their path must detour (Shor, 1980). It is most of the time human resistance to letting go of old self that is a major cause of transformative education failures; frequently those entering keep one foot well planted in the daily world (McWhinney and Markos, 2003) and this hinders the completion of the cycle of transformation in one's life. In the transformation from the old way of living to a new and sustainable way of living, education and learning could play critical role. It can equip learners with critical thinking and the power of reflection on issues, and enhance the spiritual development of an individual. All these are critical to the development of sustainable lifestyle.

In some cases, processes for inducing confession, disowning, and ego release are essential to clear one's spirit for new possibilities (McWhinney and Markos, 2003). We may grieve over the loss of our old self in order to take a new form informed by inward changes emanating from a change in our frame of reference. Grieving unlocks the spirit and washes away association with prior successes and failures (McWhinney and Markos, 2003). However, a transformed person does not forget the old life. The old life is there because it has formed a part of the individual's living experience. Sometimes, this old pattern of living is recounted but all has transformed inside the individual and he/she has become a new person and the old life is given new meaning. Daloz (1986, p.26) stressed this point when he said that when we undergo transformation, our old life continues to be there, but its meaning has profoundly changed because we have left home, seen it from afar, and been transformed by that vision; you cannot go home again, or rather, the home to which you return is not the same as the one you left. The metaphorical use of leaving home and returning to a new home implies that a transformed person leaves the old way of thinking and acting; the old mind is gone and even if there is a return to reconnect the old mind, the mind of a transformed individual instead reconnect the new mind. Transformation in the life of an individual enables the individual to live a more careful life. A transformed individual is likely to become conscious of himself and his environment, taking into account the implications of any action he/she takes. Such an

individual sees everything from a new perspective and thus, could begin to appreciate the need for change towards sustainable living. In other words, transformation has to do with a change in the level of learner's consciousness. This change might be encouraged through the process of education.

For students entering university for the first time, gaining of transformative experience starts from the day of orientation. Orientation is a kind of initiation that opens students' eyes to things around them. The learning that occurs on orientation day at the university, for example, initiates transformative learning which Brodhacker (2012) said it challenges learners to reflect on the way their past experiences have shaped the students and can lead to their essentially adjusting their views, feelings, thoughts, and actions which can change the way the students identify and interact with the world. The author explained that in this process, the learner's daily activities, relationships, and visions for the future can be changed in four stages of transformational learning process which are: (i) recognising a specific problem and deciding that there is some form of change that is necessary in the person's life in order to deal with the problem; (2) confronting it intensely by addressing the problem without time-wasting; (3) finding a solution to the problem by evaluating the problem and reaching conclusion on what step or steps that need to be taken to solve the problem; (4) integrating a new perspective and a new set of assumptions into one's life by looking at things in a different way and doing things differently.

Transformation is the soul of ethical and spiritual living, and without the learner being transformed, these essential elements that enhance sustainable living will continue to be missing in the life of the learner. Supporting the view that the development of the spiritual life is essential for transformation towards sustainable living, O'Sullivan (2001, p. 259) stated that he believes that "any in-depth treatment of 'transformative education' must address the topic of spirituality and that educators must take on the concerns of the development of the spirit at a most fundamental level." This essential element in the transformation of the learner is said to be neglected by contemporary education that suffers deeply by its eclipse of the spiritual dimensions of our world and universe (O'Sullivan, 2001). However, it is the researcher's view that contemporary education recognises the importance of spirituality in the transformation of people but because of the difficulty of distinguishing between spirituality

and religion, its introduction into higher education is carefully avoided as a way of reducing religious conflict at school. This is important going by the fact that most of the universities in the world admit students from different cultures and religious backgrounds. In such universities, global issues such as climate change and sustainability issues that have no direct religious connotation are however discussed.

## 3.6 Global Education - Transformative Learning - Sustainability Link

"Everything everywhere is linked in a single system. Therefore every action must be considered in the context of its effect on the whole system" (Taylor, 2007, p.15). Global education, transformative learning and sustainability are interconnected in the drive towards making the planet a better place for human habitation and survival. Global education serves as an instrument for discussing global issues and transforming learners towards sustainable living. The reason for restructuring education from what each country use to plan and manage for their own citizens and few immigrants to global education was not to react quickly to global challenges, but to build sustainable and objective-oriented future for all (Finland Ministry of Education report 2006 cited in Pudas 2009). Global education seeks to improve knowledge through inquiry, shape peoples' attitudes regarding the themes and issues that are of global concern and enhance action that is based on strengthened convictions on these issues (Finland's Ministry of Education, 2006). One of such global issues that are being addressed through Global Education approach is sustainability crisis. The most common approach employed by universities to educate students on these issues is education for sustainable development. In this section, the relationships between the three concepts: global or international education, transformative learning and sustainability are explored.

## 3.6.1 Historical Development of Global Education

Global education is not something new. It has been in existence for many decades. Supporting this view, Hicks (2003) said that to make many not to think this is a recent educational interest in global matters, it is important to recall that there are a variety of cross-curricular concerns which have a long history in the UK – including 'global education'. The history of global education was summarized by Hicks (2003) thus: development of Global education dates back to 1920s when progressive teachers set up the World Education Fellowship with its journal *The New Era* and, in the late 1930s, the Council for Education in World Citizenship. From this point, Derek Heater (1980) explored this development and

issues that contributed to what was then known as 'education for international understanding'. In the 1960s, James Henderson and his colleagues at the University of London Institute of Education came up with the term 'world studies' as an acknowledgement of the need for global dimension in the curriculum. In the 1950s, Henderson had worked with the Parliamentary Group for World Government, made up of members of parliament drawn across political parties who founded an educational charity called the One World Trust. In 1973 the Trust set up a curriculum project to look at issues of world order and, in so doing, gave birth to the UK type of global education.

Hicks (2003) argued that what we are seeing now is therefore a renewed interest. According to the author, different terms are used by educators to name this concern – that global issues need to be explored appropriately in the curriculum. These include global education, development education, global citizenship, global perspectives, and global dimensions. There could be slight differences in these terms but the goal of the advocates tilt to the same direction. In support of the view that global education is not something new, Jaaskelainen (2013) said that the early phase of global education dates back to the late 1960's and early 1970's. This agreed with Jicks (2003) account that the term 'world studies' which meant the same thing as global education was coined in 1960 by James Henderson and his colleagues at the University of London Institute of Education. In 1974, the UNESCO General Conference adopted the recommendation regarding education for international understanding which the main concern were problems of the world and the role of UN in solving them, human rights, other countries and cultures, and man and his environment (Jaaskelainen, 2013). This UNESCO Recommendation on International Education served as a tunic to many countries in the world to adopt international education (Savolainen, 2010 as cited in Jaaskelainen, 2013).

A further boost to global education came from the decisions reached at the Maastricht Congress on Global Education. For example, O'Loughlin and Wegimont (2007, p.5) explained that when the "European Congress on Global Education to 2015" was convened in November 2002 in Maastricht, the congress was something of a milestone in the growth of global education in Europe because it:

•      Drew attention to the political necessity of support for global education as a necessary condition for critical public engagement with global development and sustainability issues;

• Focused commitment on European and national strategies, providing opportunity for national actors to start the process of development of national strategies, including strategies for improvement, quality and evaluation;

• Called for the establishment of a European Peer Review system for global education, and for a target percentage of national Overseas Development Aid commitments to be set apart for global education.

The attention given to global education in this congress as a means of educating people towards sustainable living showed that global education is gradually becoming a focal point for engaging learners in sustainable development education. As stated in the Finish National Board of Education (FNBE 2003 as cited in Jaaskelainen, 2013), some of the objectives of cross-curricular themes in national core curriculum from the perspective of Global Education aimed at helping students to  achieve the aim of sustainable development. This aim was to guarantee the present and the future generation opportunities for good life through learning how to adapt to the conditions of nature and the limit set by global sustainability (FNBE, 2003 as cited in Jaaskelainen, 2013),  FNBE (2003) also stated that global education will make  students to be able to work together with their colleagues and others for a better future on international level, and to reflect on issues of population growth, poverty and hunger; to enable students to be aware of the shared universal human values or the lack of these values in the world as a whole. Thus, one of the aims of Global Education in which sustainability education is a major component is to transform students to think, live and act sustainably. It will enable students to "appreciate cultural diversity as part of the richness of life and as a source of creativity and be able to reflect on the objectives of cultural development in the future…endeavour to contribute actively to the construction of multicultural society based on mutual respect" (FNBE 2003, pp. 25-29 as cited in Jaaskelainen, 2013, p.88).

### 3.6.2 Perspectives on Global Education

Global education is a wide concept that has different forms and meanings. As noted by Selby (1999), the concept has multiple interpretations and many varieties and like sustainability, the term has experienced the same kind of "semantic inflation". Most of the definitions focused on including global issues in the curriculum and addressing issues of global significance. However, out of the several views and definitions of global education, the one I identify with is that global education cannot be anything less than the educational expression of an

ecological, holistic or systemic paradigm (Capra, 1996; Capra and Steindl-Rast, 1992 as cited in Selby, 1999) and, as such, it has implications for the nature, purposes and processes of learning and for every aspect of the functioning of a school or other learning community (Greig, Pike and Selby, 1989 as cited in Selby, 2004; Pike and Selby, 1999). What makes this definition unique is that it included ecological and holistic paradigm as significant for evolving a learning process that can lead to attaining sustainability.

Explaining the holistic nature of global education, Selby (1999, p.126) stated that "Global education is an holistic paradigm of education predicated upon the interconnectedness of communities, lands and peoples, the interrelatedness of all social, cultural and natural phenomena, the interpenetrative nature of past, present and future, and the complementary nature of the cognitive, affective, physical and spiritual dimensions of the human being". It focuses on issues of development, equity, peace, social and environmental justice, and environmental sustainability and covers the personal, the local, the national and the planetary in scope (Selby, 1999). And in line with its precepts and principles, the pedagogy of global education is experiential, interactive, children-centred, democratic, convivial, participatory and change-oriented (Selby, 1999).

Global education that is holistic makes the learner a more reflective practitioner – where reflection soon opens up the inquirer into the more troubling terrain that paves way for the attitudes, beliefs, and values of the inquirer to starts to have impact on matter being reflected upon, along with the somatic content that goes with it (Taylor, 2007). Therefore, any definition that fails to view global education from holistic perspective could be said to be inadequate. Also, an adequate definition of the term should go beyond curriculum contents. In the view of the researcher, global education can be defined as education aimed at addressing ecological/environmental issues, educating learners on social justice, conflicts and security, world peace and so on through the use of approaches to teaching and learning that transforms the individual learner's way of thinking and acting in relation to global issues. In using global education to transform society, its different dimensions ought to be integrated with transformative learning and education for sustainable development (EFSD).

In exploring the nature and dimensions of global education, some important observations about the field have been made. Tye (1999 as cited in Hicks, 2003) in his exploration of

global education in over 50 countries found that both acceptance of, and the form of such education varied considerably. However, despite the differences in the variety of global education, "the most common issues identified (in order of frequency) were: ecology/environment, development, intercultural relations, peace, technology, human rights" (Hicks, 2003, p.269). It is interesting to note that ecology/environment was identified as the most important dimension of global education. This indicates that this dimension of global education is of the greatest concern to many countries. However, that ecology/environment came top when the varieties of global education were considered in the order of frequency did not imply that other dimensions of global education were less important. Education for peace is important but it should also be noted that if the world ecology and environment are shattered, it could disrupt peace.

### 3.6.3 Dimensions of Global Education

For any country or educational institution to claim that she is involved in global education, there are certain core elements that must be present. I believe it is possible to identify the core elements needed for any endeavour to be labelled as global education (Hicks, 2003). These core elements have been identified by Pike and Selby (1995 as cited in Hicks, 2003) to include temporal dimension, spatial dimension, issue dimension and inner dimension (Figure 3.4):
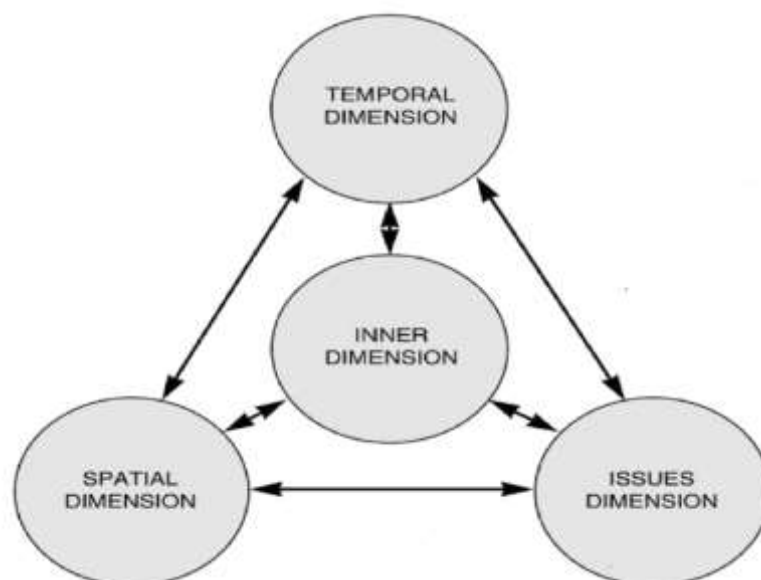


**Figure 3.4:** A four-dimensional model of global education (Pike and Selby, 1995 cited in Hicks, 2003, p.271)

Each of these four dimensions has to be present before one can claim to be involved in global education or promoting a global dimension in the curriculum (Hicks, 2003). The author argued that anything short of this fails to address adequately the global condition (Hicks, 2003). The interconnections between the four-fold dimensions indicate the holistic nature of global education.

The spatial dimension addresses the idea of interdependence and interconnections that exist at multiple levels such as intrapersonal, interpersonal, local, bioregional, national, international and global levels (Selby, 1999). This shows that nothing is separated but interconnected at different levels. The local is embedded in the global and the intrapersonal. Also, the interpersonal exists within the local and global order. Therefore, the levels are not mechanistically conceived as concentric circles with, for example, local and global at opposite ends of the pole (Selby, 1999) but as an "unbroken wholeness" (Bohm, 1983 as cited in Selby, 1999, p.130) mutually embedded in a dynamic relationship (Selby, 1999). The implication of these relationships is that the global encompasses everything within the Earth, and is by definition, manifest within the local; the local flows into the global. What happens at the global level affects the local and an event that occurs at the local level can reverberate through, and significantly affect all other levels, feeding back through the whole to further transform the level and point of origin (Selby, 1999). These relationships explain what exists between human activities and environmental issues. The activities of individual and corporate organisations at local level affect the earth and its inhabitants (plants and animals) globally. It is therefore suggested that we engage the form of education that could enable learners to cultivate a holistic mindset and the required skills for acting and behaving sustainably (Selby, 1999).

The issue dimension requires that learners should learn key global issues and themes that have multi-level, personal and local significance such as development, environmental issues, health needs/right, peace, sustainability and so on (Selby, 1999). According to Selby (1999), issue dimension also means that learners are encouraged to consider diverse perspective on these issues and themes from a variety of cultural, disciplinary, social, ideological, and paradigmatic vantage points. He argued that the issues and themes are looked upon as enfolded in each other. For example, a seemingly 'environmental issue' is likely to contain within it aspects related issues to all other themes and issues (Selby, 1999). By implication, the third meaning of issue dimension is that everything in the world is a network of web,

interconnected and interwoven. In other words, "…each object in the world is not merely itself but involves every other object, and in fact is everything else" (Pike and Selby, p.13 as cited in Selby, 1999, p.1310).

The temporal dimension refers to the different phases of time – the past, present and future – which though distinct, cannot be separated from each other. The future is a "zone of potentiality" (Pike and Selby, 1995, p.16 cited in Selby 1999, p.131) or potentiality as a plethora of "virtual" transitions spread across present reality (Zohar, 1994, p.50 cited in Selby, 1999, p.131) or that which emanates from within the implicate order of reality (Weber, 1986 as cited in Selby, 1999). The temporal dimension requires that learners should reflect upon alternative futures. Alternative futures according to Selby (1999) are divided up into probable futures which are likely to occur if present trend continues; possible futures, futures that might conceivably come about or whose virtuality with nature could be achieved, and preferred futures, futures that based on our values, we would like to have come about (See Figure 3.5).
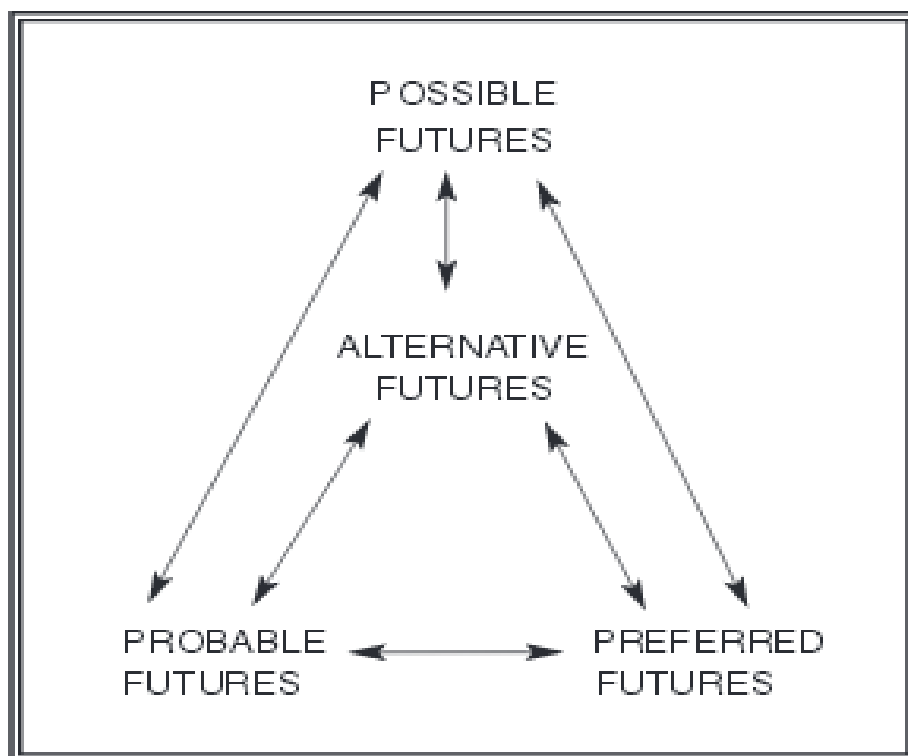


**Figure 3.5:** The temporal dimension of global education
**Source:** Selby 1999, p.136

Selby (1999) argued that through envisioning such alternatives, heightened responsiveness to the latent potential of situations, and by intellectual and sensorial engagement in the present, as well as developing our capacity and skills for change agency, we can become transforming learners. To envision these suggested alternatives and be able to respond to the situations, the pedagogy of learning which attaches much importance to the academic contents of education rather than the impacts of learning on the learners may need to be reviewed. By approaching teaching and learning from impact perspective, education could be used to make learners develop reflective minds capable of understanding and adjusting to the environmental dynamics required for creating a sustainable future.

Then, the inner dimension of the model indicates that our self-world that is a co-evolving world shifts in consequences in response to the sum total of our ongoing interactions and exchanges with the wider world (Selby, 1999). This implies that the ecosystem is responsive to human interaction and it is how humankind relates with the planet that determines the result that we get. Thus, if humanity continues interacting with the environment in unsustainable manners, the consequence could be a degenerating planet that will not be able to support life in the future. The implication of this is that we may never realise our preferred futures. However, if teaching and learning is impact directed rather than producing graduates whose main interests are the kind of work and money they get after graduation, the current global environmental and other sustainability crisis could be reduced. In this regard, educators have a role to play.

Global education offers teachers a great opportunity to assist in grounding the global economic and political order in different values and practices. Since global education leads to the discussion of global issues, the integration of global issues in teaching and learning could have impact on the learners from different cultural background. So, in the context of Global Education, "What we teach, what we don't teach, and how we teach …" (Moore 2005, p.78) count in the creation of sustainable society. In this regard, the various dimensions of global education provide teachers with the opportunity to teach students what can transform them to recognise the importance of caring for the Earth. In line with this view, Selby (1999) and Hicks (2003) believed that global education has the capacity to make learners see the need for living by the principles of sustainability. Also, Krause (2013) noted that since the 1960s, when the debate about globalisation began to flourish, global issues started to be increasingly integrated into education systems, school curricula and the practice of formal education and

this has led to a more didactical thinking in Global Education. This development further led to further development of Global Education into Global Learning: "a common approach that focuses on the development of the individual learner's capabilities to understand the globalised world society and to act in an informed and responsible way" (Krause, 2013, p.127).

From the forgoing, we can see that Global Education has conceptually gone far beyond the development framework (Krause, 2013, p.127) although the whole development in Global Education seems to be Eurocentric and this could be limiting in its ability to fulfill its core mission which according to Krause (2013), is to facilitate change and empower citizens in the North and South, East and West and in the middle.

## 3.6.4 Growing Integration of Global Education, sustainability and Transformative Learning

The globalisation of education and the increasing needs for creating a sustainable society has led to the integration of transformative learning and sustainability with global education. This was perhaps why, Selby (1999) argued that in its transformative, holistic and biocentric nature, global education is sister to two important global proposals: holistic education and transformative learning. Thus, it could be said that global education is transformative. In support, Selby (1999) stated that global education is transformative, holistic and bio-centric; hence, it could help learners to develop sense of connectivity. It can therefore be concluded that global education, transformative learning and sustainability have gradually been integrated to form an educational paradigm that opposes mechanistic and reductionist form of education.

Reductionism encouraged separateness of all things but global education emerged to counter reductionism and use sustainability education to redirect the worldviews of those who have become friends of the Earth from seeing the world in fragmented form to seeing it as one whole system made up of dependent parts. This development has led to the introduction of holistic approach to education in some higher institutions that operate global education approach. Supporting this holistic approach to education as engineered by global education, Selby (2004) argued that in their most transformative expressions, global education can be seen as educational countercultures to mechanism and reductionism as they have colonized

education, and as educational expressions of holistic paradigm. The nature of integration of global education, transformative learning and sustainability can best be illustrated with the billiard ball model and the web model (Figure 3.6 and 3.7).

The billiard ball model – representing a cluster of billiard balls on a billiard table - has been used to indicate separateness, discreteness, and forms of external relationship between things where the relationship has no effect upon their internal structure and dynamics (Zohar, 1990 as cited in Selby, 2004). In the way people view the world, the billiard ball model and the web model find expression in the division between quantitative ontology and worldview as exemplified in the study of natural science like chemistry, physics and biology. Natural sciences see the world as an object made up of substances that can be separated and treated differently if there is a problem with any part (mechanistic worldview). On the other hand, those who view the world from social constructivist perspective see everything as interconnected. They believe that any problem that affects a part affects the whole (system thinking). This is constructivist's worldview and is represented here by the web model (Figure 3.7).
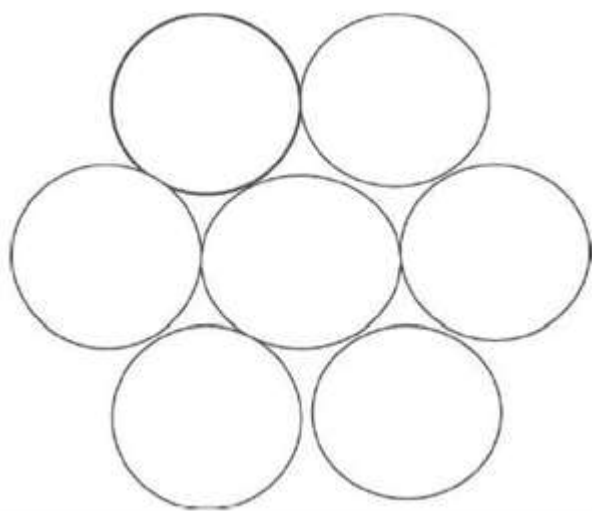


Figure 3.6: Billiard ball model                    Figure 3.7: Web model, p.26
   Source: Selby, 2004, p.24

According to Selby (2004, p.24) "Transformative global and environmental educators have countered the model or metaphor of the billiard ball with the model or metaphor of the web (understood dynamically)". Selby (2004) stated that the web model appeared to convincingly capture understandings drawn from ecological and quantum (sub-atomic) science that:

- All things on earth is interconnected and related to every other thing in a dynamic sense;

- Nothing can be completely understood in isolation from all other things;

- There are many sides of identity and this include things that are near and far from us;

- Anything that happens in any part of the world affect elsewhere in the world in significant way or in small proportion;

- What happens locally is also a global phenomenon (a part of the whole, itself acting to inform the whole) and that the signature of global events will have impact locally;

- Global issues as environment, development, health, peace, rights are interconnected.

- Past, present, and future are interconnected, co-evolving and co-creating elements of time.

The web model justifies the reasonability of system thinking. As global education has continued to develop, educationists in this field have followed the ideas in the system thinking model and the web model to develop curricula and approaches to teaching that attempt to create a sense of interconnectedness in learners. Supporting this view, Selby (2004) argued that global and environmental educators have used insights captured by the web metaphor to develop curricula, teaching materials, and learning activities built upon the concepts of interconnectedness, interdependence, and interrelationship (see, for example :Fountain 1995; Pike/Selby 1999; 2000; Townsend/Otero 1999 as cited in Selby, 2004). These relationships can also be seen in the interconnections between global education, transformative learning and sustainability.

Under global education, students learn about sustainability and other global issues. Sustainability education aims at making learners to see the need for living a sustainable lifestyle. This means that global education aims at creating awareness in learners and developing in them the skills and knowledge required for managing the environment and other global issues. With regard to sustainability as an integral part of global education, it was introduced to provide a means of reducing the environmental impact resulting from industrial

operations, product usage and disposal (Chiesa, Manzini and Noci, 1999). This implies that its introduction was to provide a means of dealing with the type of problems concerning the deteriorating relationship between global ecology and the growing economic development (Chiesa, Manzini and Noci; 1999; Faber, Jorna and Engelen, 2005). Sustainability pointed out ways in which an economic development could be attained, while taking supposed environmental limits into consideration (Meadows, Meadows and Randers and Behrens, 1972 as cited in Faber, Jorna and Englelen, 2005).

As part of the solutions to reducing the problems of resource depletion resulting from unsustainable ways of living, some scholars have offered suggestions on how to address the issue. For instance, Ebohon and Rwelamila, (2000) opined that within the biophysical sphere, there exists a huge opportunity for enhancing environmental sustainability, especially with regards to global resource consumption and depletion of non-renewable natural resources. This can be achieved by using recycled materials in the place of new ones (Ebohon and Rwelamila, 2000). It may also be reasonable to reduce the materials that go into the production of certain goods while simultaneously ensuring that quality does not fall. In support of this view, Ebohon and Rwelamila (2000) argued that in building construction, there is need for people to engage in sustainable construction process. They cited the example of the Friends of the Earth and Wupertal Institute for Climate and Energy that has since realised the big difference that sustainable construction process could make to global environmental sustainability. For instance, with reference to the United Kingdom construction industry, the authors said that Friends of the Earth have asked for a 73 percent reduction in cement consumption, 88 percent in aluminium, 83 percent in steel, 73 percent in timber and 50 percent reduction in total as necessary step towards United Kingdom fulfilment of its environmental targets and obligation by 2050. However, for this to have global impact, it is not only the United Kingdom, and perhaps a few other countries that will need to be advised to reduce the quantity of resources that go into building projects. It is also important that developing countries that are experiencing even a higher rate of construction be made aware of what sustainability is all about and how to create a sustainable planet.

## 3.7 Paradigm Shift in Global Education

Now that there is huge literature and overwhelming evidence indicating that human activities contribute substantially to environmental sustainability crisis, our approach to education and

learning needs to be tailored towards producing graduates with sustainable values. Substantiating the implications of human activities in the creation of sustainability crisis, The United Nations' Intergovernmental Panel on Climate Change (IPCC as cited in Higher Education Funding Council for England, HEFCE, 2009) concluded that warming of the climate system is clear and that human activities make a substantial contribution. This is however not the only problem facing humanity but as Kazdin (2009) noted, although there are always challenges facing the world, an urgent one facing humanity now is the degradation of the environment on a global scale. This problem has led to many and diverse environmental crisis such as climate change, flooding, decreasing soil fertility, destruction of aquatic life, desertification to mention a few. Stressing on the dimension of sustainability crisis in his forward to the document: *Sustainable development in higher education - update to 2008 strategic statement and action plan,* Brentford (2009) stated that, climate change constitutes the greatest environmental challenge facing the world today. Going by the devastating consequences of climate change on human lives and its negative impacts on global economy, there is no doubt that it is the greatest problem facing mankind in recent times. But it is not climate change alone that constitute major problem. Resources depletion, consumption pattern and unethical business practices are also among the challenging issues of the 21$^{st}$ century. However, one can argue that some of these problems are the offshoot of climate change and excessive industrialisation.

As humanity faces the challenges posed by sustainability crisis, it is becoming clear that the values, behaviours and attitudes that are responsible for these crises need to be transformed from unsustainable to sustainable ways of living. In this regard, many advocates of sustainability (e.g. O'Sullivan 1999; Sterling 2011; Orr, 2004) have suggested that there is need for a reorientation of our thinking that will require a paradigm shift in education. In order to meet the global challenges posed by climate change and ecological degradation (Goodman, 2011), we need a paradigm shift from transmissive to transformative form of education (Sterling, 2011). Transmissive education is instructive, that is, associated with the transfer of information (Sterling, 2011) from the instructor who assumes the status of an expert to the learners who assume the position of passive receivers. On the other hand, transformative approach to education is constructive, giving the learners the opportunity to construct meaning from the interaction between them and the instructor (Sterling, 2011). According to Goodman (2011), to achieve sustainability requires engaging learners in transformative and 'deep' (second and third order) learning. The author noted that "an

education that ensures graduates are better equipped to perform…but fails to link…with ecological health is not the point". Education ought to be a process of transforming individuals, and organisations so that the main values and assumptions regarding human relationship with each other and the planet are taken into consideration (Goodman, 2011). This requires moving beyond the first order learning to second and even better still to third order learning (Sterling, 2011).

First order learning is adaptive learning which only helps the learner to acquire skills and knowledge to help in adapting to new roles, whilst second order learning helps the learner to be critically reflective (Goodman, 2011). As noted by the author, second order learning prepares the learner to challenge prior assumptions by examining assumptions that underpin first order learning. First order learning does not challenge basic values and assumptions (Goodman, 2011). The point is that education should be a change agent in relation to sustainability to help minimize the problem. In support of this view, Sterling (2011, p.35) stated that many international statements and mandates have pointed to the key role of education as a change agent which range from creating new behaviours in individuals, groups and society as a whole toward the environment (UNESCO, 1978 as cited in Sterling 2011, p.35), to being "critical for promoting sustainable development and improving the capacity of the people to address environment and development issues" (UNCED, 1992 as cited in Sterling 2011, p.35).

Furthermore, Agenda 21 talked of the need to 'reorient' education to address sustainable development issues (Sterling 2011). Equally, "in the European Union, there is the 1988 resolution on Environmental Education and the Environment Programmes which put store by education and training in achieving sustainable development" (Sterling 2011, p.35). Despite these calls, it is argued that the world's education communities have not responded as expected. Emphasising the non-response of the world's education communities to the calls, Sterling (2011) stated that in the last UNESCO conference, 1997 in Thessaloniki, UNESCO was reflecting on why the world's education communities had not responded to these clarion calls. As UNESCO's then Director-General pointed out, "Who would deny that too little has been achieved" (Mayor, 1977 as cited in Sterling 2011, p.35-36). While I share the view that too little might have been achieved, it cannot be said that the world's education communities have not responded to the call for embracing sustainability. The problem is that certain things could be wrong with the response strategies. For instance, scientific and technological

responses to the issue have been in place for many years now but these have neither reduced the problem nor solved it. Hence, it looks as if no responses have been coming from the world education communities. Now that a new way of thinking that is different from scientific approach is gradually replacing the old mechanistic way of thinking, response from education sector could begin to yield results. This new wave of thinking is a kind of response from the education sector.

The new wave of thinking goes beyond the dominant forms of thinking. The dominant form of thinking is analytic, linear and reductionist (Sterling, 2011). The new form of thinking is integrative, holistic and ecological. Supporting this view, O'Sullivan (1999) stated that we are beginning to see that there is a new wave of thinking coming from diverse voices that gives a sense of wider and deeper connection to the earth, and view the earth as a sacred presence in the universe as opposed to the earlier voices that treat the earth as dead matter for human exploitation. This argument suggests that a form of paradigm shift is already taking place. Paradigm shift that could enhance movement towards sustainable planet is important because there is an ethical bond with the future generations that compels us to act sustainably (Reardson, 2008). The importance of addressing sustainability issues and the urgency it requires call for a new paradigm that will be in tune with sustainability principles.

As they can be no central paradigm that can solve all problems, "an emergent paradigm aligned with sustainability would fundamentally expand Kuhn's concept of paradigm as an accepted pattern or model on which subsequent practice is based" (Abesuriya, 2008, p.68). In the current ways of solving problems, underlying paradigms and worldviews provide a lens through which problems are analysed and seen and their solutions devised, and "proponents of competing paradigms practice their trades in different world" (Kuhn, 1979, p.150 as cited in Abesuriya, 2008, p.68). For example, Bredo (2009), explained that reductionist attempt to get rid of vagueness by breaking wholes down into more definite, testable, or observable parts while holists see the larger meaning or significance of fragments by identifying wholes of which they are coherent parts

The reductionists' worldview and their way of perceiving problems undermine the reality that there is always multiple ways of perceiving problems and finding solutions to them. The danger inherent in the reductionist way of thinking is that it neglects the plurality of perspective and, therefore puts human approaches to problem solving in a box. Sustainability

discourse requires that they should be more than a single way of perceiving contemporary problem, and therefore, a "plurality of legitimate perspectives" (Abesuriya, 2008, p.68) should be considered. The whole system thinking for example, is an emergent paradigm which seeks to accommodate multiple legitimate perspectives and provides problem solvers with a broader menu of key solutions to choose from rather than a single model or approach. This pattern of thinking that looks at the world from perspective of a whole rather than from breaking them up into parts will lead to our seeing the interconnections between the parts that make up the earth and the need for treating each part with respect, knowing that what is done to any part affect the whole (Abeysuriva, 2008; Salisbury, 1996; Sterling. 2003; Selby, 2004). This type of thinking is said to be beginning to take place within Global Education. This change has been described by Wigemont (2013) as a paradigm shift in Global Education.

As noted by Sterling (2011), ecological or whole systems thinking has the potential both to critique current educational theory and practice and to provide a basis by which it could both be transformed and transcended. A system of thinking that leads to change in perspective enables a shift in paradigm. A shift in paradigm will change the way we perceive the world. Sterling (2011) argued that the root of the problem of the world lies in the crisis of perception; of the way we see the world. He noted that there are calls for a new way of thinking which would allow us to go beyond the limits of thinking that seems to have led to the current global predicament. Sterling (2011) suggested a new way of thinking that is integrative, holistic, connective and ecological. The researcher shares a similar view. I believe that in the global education approach to teaching and learning, a kind of paradigm shift is already taking place. In support, Wigemont (2013) stated that the changes in education that led to the move to integrate Global Education into national curricula and the reform of curricula, as well as the acknowledgement of the need for a partnership approach are part of a paradigm shift in Global Education over the last decade. Within Global Education field, the integration of Education for Sustainable Development (ESD) into the curriculum of some universities in the world and the cooperation between the governments and the Ministries of Education in many countries to implement ESD in schools, especially at university level, is a kind of paradigm shift (Wigemont, 2013). According to Wigemont (2013, p. 197) there has been in the last decade, "a growing integration of the concern of development and Global Education within national curricular and growing inter-ministerial cooperation between Ministries of Foreign Affairs and Ministries of Education". The author noted that these changes are part of paradigm shift taking place in global education over the

last decade. A paradigm shift of this sort represents a shift in thinking that could be required to address sustainability issues.

A shift in paradigm is necessary in order to enable learners explore problems and issues relating to sustainability from a new perspective. In the words of Wigemont (2013, p. 1998), the notion of paradigm shift within a paradigm makes people to see reality through a new lens and as a result, things can be seen differently, and done differently and this could lead to new result that is better than the old. Underscoring the importance of paradigm shift from reductionism to holistic approach to problem solving, Juniper and Skelly (2010) argued that making a shift to think and act in a more holistic and systemic manner gives humankind the opportunity to make connections with the seen and unseen, the testable and the not testable and the not easy to test forces of nature that all join up to shape the present and the future of the planet.

## 3.8 The 'Ecology' of Education Movement for Change

Environmental sustainability crisis is more often than not attributed to the growing trend of unsustainable human activities. For instance, cases of flooding and the destruction of wealth it causes are partly the result of poor habit of waste disposals. In Africa, for example, people deliberately throw refuse into flowing rivers or build houses across river course and this sometimes leads to the blockage of the river course and subsequent flooding (Karley, 2009). Those involved in dumping refuse into drainage/sewerage channels believe that during rainfall the garbage will be carried away smoothly through gutters, but this causes flooding (Karley, 2009). However, it is also possible that those who engage in the activities described by this author do not do so deliberately. Perhaps, there are some or many of them who are ignorant of the consequences of their actions. Such persons attribute flooding to natural causes. In this latter situation, the creation of awareness could help change the attitudes of the urban and rural dwellers that act unsustainably. Therefore, it is essential to have a holistic approach towards resolving the flooding problem and at the same time devising approaches to reduce each specific sustainability problem (Karley, 2009).

On the other hand, some of the unsustainable behaviours, attitudes and actions of people are often linked to the modernist education system that enhances consumer industrial production

without concern for its implications to sustainable future (O'Sullivan, 1999). Whichever factors are responsible for the sustainability crisis, our hope is that there exist movements aimed at leading the world through sustainability path. One of such movements is seen in the increasing dimension of global education. Since the 1960s, Global Education has been steadily moving from side-line concern of development NGOs, to an approach that has been described as Universalist, right-based approach (Forghani-Arani, Hartmeyer, O'Loughlin and Wegimont, 2013). The authors said that in this movement, the advocates for Global Education and those who are involved in education systems work hand-in-hand, and this has led to the rejection of an approach that looks at education system as target for Global Education and a more realist engagement with the realities of change in the education systems.

In the change that is taking place, different categories of people are involved. Among them are those engaged in the promotion, increase and improvement of Global Learning as they grapple with the real and detailed issues of how to ensure that Global Learning is at heart of curriculum development and curriculum reform (Forghani-Arani, Hartmeyer, O'Loughlin and Wegimont, 2013). This trend in the development of Global Education can be seen to be an important initiative when it is recalled that people "rarely change their behaviour in response to a rational call to do so …" (Vare and Scott 2007, p.1). Perhaps, since global education is partly concerned with sustainability issues, it could enhance transformation in the attitude of learners towards sustainable living.

Sustainability education exists within the framework of Global Education system. Global Education is said to be transformative in contents and goals and this is vital for producing learners with sustainable behaviours and attitudes. Going by the key characteristics of Global education as identified by Krause (2013, p.125), we can see the possibility of this field of education helping to transform learners to live sustainably. According to the Krause (2013, p.125) the key characteristics of Global education are:

- o It makes people to understand more about the globalised world;

- o It is value-based and grounded on ethical foundation;

o It facilitates participatory, transformative processes of learning

o It supports active engagement;

o It adopts a way of seeing that is in line with the development of global citizenship

These characteristics of Global Education are relational and systemic in nature. Its goal of producing global citizens, facilitation of participatory and transformative learning processes and its support for engagement suggests that Global Education has the power to change the linear processes of thinking in our predominantly industrial society. It also challenges the idea that it is possible to change people through sustainability education without first transforming the orientation of the people. It can be argued that both the people and the society need to be transformed in order to attain a sustainable future. To some extent, it is the people in society that are responsible for most of the problems prevalent in it. Therefore, the transformation of people can be viewed as synonymous with the transformation of society.

Movement for change in the education system to bring about ecological transformation is a movement that is embedded in the broader educational system, and in turn, both ecological education and the broader educational system exist within a larger social system which influences both. According to Sterling (2011), using this understanding, movements for educational change such as sustainability education can be seen as subsystems of the larger mainstream formal educational system.  In this regard, educational system can be seen as sub-system of the larger socio-economic and cultural systems, which also directly educate people (Sterling 2011).

Presently, there is a kind of nesting system in the relationships that exist between the education system, social, economic and cultural systems and the larger biophysical system. This nesting system shows that it is difficult if not impossible for sustainability education to change people without the society itself changing together with it. And the society can only change for the better if the people that live in it are transformed. By implication, the transformation of the people in the society and education towards sustainable living cannot be separated (see Figure 3.8 below):
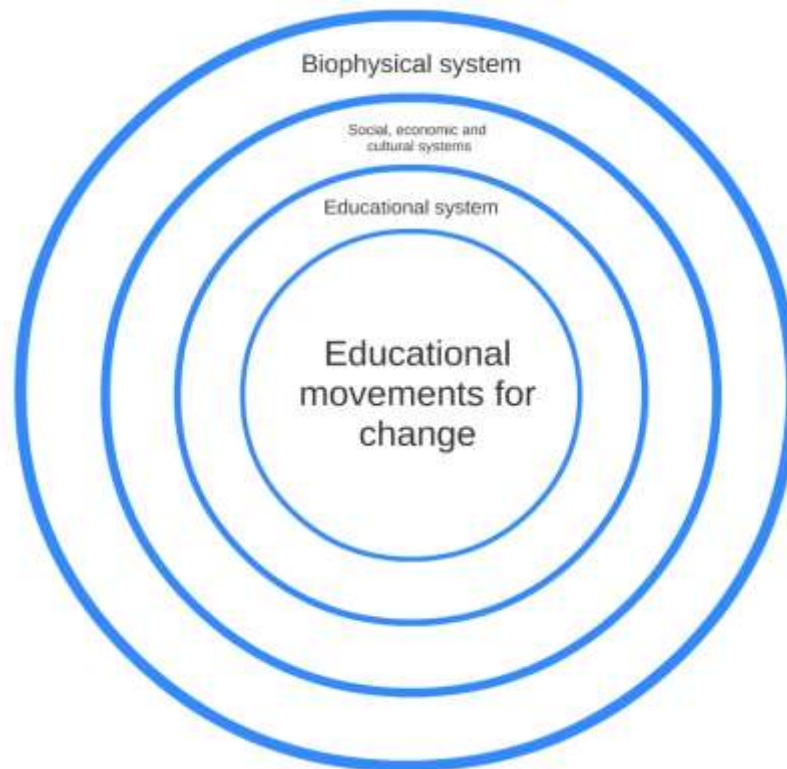
**Figure 3.8: Nesting System**

**Source:** Sterling 2011, p.33

This existing relationship between education, the people and cultural system implies that to change the part, the whole needs to be changed. This involves thinking systemically. Supporting this approach, Sterling (2011) stated that the systems approach encourages a change of question, to how can education and society change together in a mutually affirmative way, towards more sustainable patterns for both? He said that in systems terms, this change of focus is seeking a positive feedback loop in which change towards sustainability in wider society supports sustainable education, which in turn supports change in wider society, and so on. Thus, there is need for moving away from the model that aims at social reproduction and maintenance, towards a vision of continuous co-evolution where both education and society are engaged in a relationship of mutual transformation that makes it possible to explore, develop and manifest sustainability values (Sterling 2011). However, such relationship will only be meaningful and better understood by people through the creation of global awareness enhanced through education and advocacy.

Global awareness in a world that is experiencing increasing wave of unsustainability has great advantages. A society that needs people with transformed attitudes and behaviour will benefit from education system that aims at attitude modification. This could be achieved through measures such as teaching and learning, awareness creation through classroom and out of classroom discussions, advocacy and so on. If majority of the citizens are not aware of the problems created by sustainability crisis, they will not see the need for a change in their attitudes and behaviours in the direction required to respond to the problem. Supporting this statement, Boom and Zuylen (2013) stated that a global orientation in a world that has become 'flat' is more important now than ever because it is relevant to create understanding and appreciation of basic values and principles of mutual dependency in the world, the equality of human being and the shared responsibility for solving global issues. The global community is confronted with multiple challenges that together form a serious threat to society and the earth as a system and these include global warming, decreasing biodiversity, population growth, water, food and energy scarcity, pollution of rivers and oceans and so on (Boom and Zuylen, 2013). The authors argued that economies of all countries in the world are so interlinked in such a way that for countries to operate effectively, new competencies and open-mindedness are essential.

However, being aware of a problem does not mean that people will respond in the affirmative to solve the problem. Awareness will only create a platform for reflecting on the issue and perhaps, considering a change in attitudes and behaviours, and taking the right action that addresses the problem. Thus, there is a widespread belief amongst academics, educators, and civil society advocates that being aware of global issues that are challenging the society, and acting upon them is a necessity for shaping the opinions, attitudes and behaviours towards creating sustainable global development (Boom and Zuylen, 2013). This, according to the authors, requires that people need to develop cross-sectorial, inter and cross-disciplinary and transnational skills and attitudes.

## 3.9 Sustainability Practices in Africa, Asia, and Europe.

The level of consciousness and practices of sustainability differ from country to country. In the developing countries of the world, how the people behave and act with respect to caring for the environment, control of greenhouse gas emissions, management of soil fertility and

even the housing systems and so on are different from how the same issues are handled in developed nations. Supporting this view, Izac and Swift (1994) said that it should always be noted that the criteria of sustainability may differ from ecosystem to ecosystem, zone to zone, nation to nation. This implies that it will be wrong to generalise the practice of sustainability around the world. As a result of these differences, there is the possibility that students who come from different cultures will respond differently to global to global issues when exposed to global learning. In this section, sustainability practices in developing countries and some developed nations of the world are examined.

## 3.9.1 Africa

The practice of sustainability in Africa is not entirely new. In the traditional African society, the fertility of agricultural land was maintained through the process of land rotation. However, the creation of the needed awareness to cope with the increasing needs for sustainable living seems to be low in Africa. For instance, people may not be aware of the implications of cutting down trees. Supporting this view, Van Wllgen, Le Maltre and Cowling (n.d) pointed out that those that promote the establishment of forests to offset $CO_2$ increases have fundamental problems with programmes that remove trees, and thus biomass. It is a common practice to cut down trees in Africa mostly for economic reasons. This according to Van Wllgen, Le Maltre and Cowling (n.d), makes the potential for carbon sequestration through the promotion of tree planting campaign in South Africa small whereas the possibility of biodiversity loss is large. This situation is not peculiar to South Africa. Many other African countries also engage in the unsustainable practice of cutting down trees. With particular reference to the study done by Izac and Swift (1994) in Eroke, a village in the middle Belt of Nigeria, the authors reported that "there is some evidence that points towards unsustainability".

Sustainability in Africa is measured mainly from agricultural perspective. In this regard, sustainability is viewed in two ways: sustainability as an approach and sustainability as a property. According to Morse *et al.,* (2001), sustainability as an approach looks at some practices as 'sustainable' while others are not. The result of this view is typically a package of 'good' practice such as crop rotation, soil conservation, low or reduced use of fertilizer, pesticide, fossil fuels, and so on  (Goldman, 1995; Penfold *et al.,* 1995 as cited in Morse *et al.,* 2001). Progress towards sustainability can be monitored in this regard by simply noting

the implementation of 'good' practices (Morse *et al.* 2001). However, it is not sufficient to measure the practice of sustainability by looking at what these authors termed good practices. In some cases, conclusions reached by looking at 'good' practices may not reflect how other resources that have not been used could be used by the same people that adopt good practice in some areas they have mastery of. For instances, how does a society that adopt crop rotation, uses low fertilizer content and practice soil conservation, handle the issue of recycling, proper waste disposal and so on? In addition, with the increasing rate of globalization and its attendant mass production of goods and services, sustainability indicators cannot be based on mere observation of good agricultural practices. The ways we use the manufactured goods, our pattern of consumption and our relationship with biodiversity matter as well.

On the other hand, sustainability from the system property perspective aims to define the ability of the system to exist in some preferred state and continue to deliver its products over time (Clayton and Radcliffe, 1996 cited in Morse *et al.,* 2001). This view presents more problems in terms of definition and measurement than a simple list of 'good' practice, not least being the need to identify the system boundaries and time scale (Morse *et al*., 2001). However, the study reveals the two broad perspectives and suggested ways of addressing these problems.

With respect to the practice of sustainability by universities in Africa, they could be said to be not completely left out in the global race to create a sustainable society. As noted by Krizek, Newport, White and Townsend (2012, p.27) "There is enough evidence nationwide to detect an arms-race of sorts among universities competing for green status. Recent national campaigns related to carbon neutrality, green buildings, local food, renewable energy and sustainability reporting have boosted sustainability activities at campuses across the globe". The claim by these authors that universities across the globe are in a race for green status was further substantiated and supported by the findings of the research jointly carried out by the Global University Network for Innovation (GUNI), the International Association of Universities and the Association of African Universities (2010) on higher education institutions in Sub- Saharan Africa. The aim of the study was to determine what contributions universities were making towards sustainable development. The areas covered in the research were teaching and learning; research; outreach and services; institutional governance; and campus operations. The findings showed that "Overall, there is some leadership commitment

to sustainable development in African higher education institutions, and more than half of the respondents are addressing sustainable development issues in a variety of ways through their teaching, research, outreach functions and operations" (Mohamedbhai, 2012).

However, with regard to campus greening, the study showed that very little was happening in the area of energy conservation, waste reduction or recycling, water conservation or sustainable landscaping (Mohamedbhai, 2012). However, I have a different view with regard to Mohamedbhai (2012) view on energy conservation in Africa. Energy supply such as electricity in Africa is very epileptic and sometimes, the people stay for days, weeks and months without power. Under this circumstance, it is illogical to conclude that the people do not conserve the energy which they do not even have enough. Perhaps, given a different scenario where power supply is regular, African people might behave differently.
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### 3.9.2 Asia

In Asia, some countries experience similar sustainability practices. Such developing countries of Asia are as well agro-based economies. Findings from the study by Morse *et al.,* (2001) showed that there is declining output of agricultural products in Asian countries leading to cultivation of wider area of land. The researchers attributed this decline in production to decreasing soil fertility, and this is an evidence of unsustainability

Many Asian countries belong to the developing countries of the world were how domestic and industrial products and resources are used is said to have adverse effects on human health. According to Chiu and Yong (2004, p.1037), "Asian developing country's economies have experienced increasing environment burden with the rapid growth of their economies. The practice of 'pollute now, clean up later' caused many environmental problems and created difficulties for further development efforts". Chiu and Yong (2004) said the environmental problems in Asian developing countries (ADC) include sandstorms, acid rain, widespread water pollution, forest depletion, intensive soil erosion, floods, siltation, solid waste pollution, dumpsite accidents, and so on. This situation calls for evolving new environmental strategies to deal with the problem.

Furthermore, Shimada and Matsuoka (2011) stated that in developing countries in Asia and other parts of the world, most energy sources in the home come from solid fuels such as coal,

biomass (firewood, crop residue and animal dung). They pointed out that the particulate matter (PM), which includes CO, NOx SOx, which results from the combustion of these fuels inside residential homes in the process of cooking has an adverse impact on people's health. According to the United Nation Development Programme and World Health Organisation (UNDP/WHO) respectively 2009 report (UNDP and WHO, 2009 as cited in Shimada and Matsuoka (2011), 56% of the people in developing countries still depend on solid fuels for cooking and 2 million deaths annually are associated with the indoor burning of solid fuels in unventilated kitchens, 44% of these deaths are children and 60% of adult deaths are women. This pattern of living suggests that Asian countries and many other developing countries, though not highly industrialised live unsustainable lifestyle. In addition, because Asia's countries are still developing and like many other places in the world, the build environment through its construction operations, deconstructions and demolitions are responsible for more than 50% of all national greenhouse gas emissions (Carroon, 2010 cited in Winter, 2013). In the building technology, for example, interior installation of Air conditioning (AC) technologies for cooling in India, China, and Indonesia is happening at a rapid tempo more than was ever experienced in US and Japan (Winter 3013). In China, pollution rate is said to be very high.

With the growing population of Asia's countries and increasing urbanization, there is the likelihood that the use of greenhouse gas emission technologies will increase by over 50% in the next two decades. The implication of this is that "any claim and ambitions for more sustainable futures in Asia are severely compromised by the widespread and rapid take-up of energy-intensive methods for cooling interior spaces" (Winter 2013, p.517). For instance, in Malaysia, several incidents clearly indicated that the environmental problems due to imbalance development growth caused devastation to the environment and brought miseries to the people (Aziz *et al.,* 2012). As a way out, the authors opined that it is the responsibility of educators to instill awareness among students on preserving the environment through proper curriculum design. They said that the survey on environmental awareness and life styles showed that Malaysians have low to moderate level of understanding of environmental issues. The findings of this study provide basic information of the level of understanding of environmental issues among students from developing countries. As noted by Meerek, Halim and Madeson (2010) the result of survey studies so far conducted on environment showed that the low level of understandings of environmental issues have continued to make us experience the problems of environmental pollution, sewage disposal in rivers, open burning,

haze problem because the knowledge and awareness of Malaysians are not up to the level to think about adverse long term effect of this pollution on national economics and their life.

Writing on environmental problem in Asia, Savage, Lin-Heng and Ofori (2011) stated that in the environmental area, Asia is a curse, victim and benefactor of environmental problems, climate change problems and outcomes. They said that in rising to the challenges of development, and providing better qualities of living and standard of life, Asian governments have not been equal to the task in bringing to the communities and citizens the best environmental goods. With the increasing population of Asian countries, it is envisaged that it will be difficult for the governments of Asian countries to deliver to the citizens' developmental and environmental desirables. Supporting this view, Kotler and Lee (2009) stated that among the top 10 poorest countries in the world, five are from Asia (China, India, Pakistan, Bangladesh and Indonesia). It is argued that large populations still plague the environmental and developmental deliverables for China (1.3 billion), India (1.1 billion), Indonesia (240 million), Pakistan (172 million), Bangladesh (147 million), and the Philippines (90 million), and in other Asian states, rapidly growing populations (Lao PDR, Cambodia, Timor Leste) and aging populations (Japan, Singapore, South Korea, Thailand) are issues of concern for their governments and these have different environmental implications and impacts (Savage, Lin-Heng and Ofori, 2011). The authors noted that for small countries like Brunei, Singapore, and Kuwait which are wealthy oil producers or refiners have large income per head but carbon impacts is much higher than large countries like India, Indonesia or Thailand.

However, with the growing economy of some Asian countries and the increasing cooperation between Asian countries like China, India with developed and developing nations, it can be said that it is not absolutely correct to argue that all Asian countries will continue to be plagued by poverty and environmental issues. Asian countries like China, India and Malaysia are top sending countries of students to Europe for higher education (see tables 2.1 and 2.2). Students from countries like China could have knowledge of sustainability going by the fact that "In recent years, there have been a several initiatives in China of a local and regional nature that draw upon ideas in industrial ecology and that attempt to implement various forms of eco-industrial development" (Fang, Cote and Qin, 2007, p.316). The authors however, failed to acknowledge that China is a capitalist-driven economy and like all capitalist economies, the country could place more interest in making profit than ensuring eco-friendly

environment. It is likely that going by the nature of competition between China and other big economies like the U.S of America, Chinese eco-drive could be overshadowed by the quest for rapid economic growth and development.

The problem of sustainable development is made complex by the driving forces of capitalism. Capitalism and globalization creates disparities between the rich and the poor nations of the world. In the developed countries, the desire for economic growth and development push countries to exceed the limit of desirable exploitation of natural resources and industrial production, leading to excessive carbon emissions. On the other hand, the poor countries depend on the industrial products of the developed nations and reusing of good. In the words of Savage, Lin-Heng and Ofori (2010, p.xxxvi), "The rich thrive on tapping resources from global environment while the poor have to eke out a living from recycling and reusing goods". As the poor nations strive to survive in a world that the big nations dominate economically, enough attentions is not paid to sustainable living. This disparity of wealth between and within countries makes it difficult to enact policies to reduce carbon emissions and pollutions because both the rich and poor in both the rural and urban areas are contributors to environmental problems: the rich leave a massive ecological footprint around the world by their environmentally unfriendly conspicuous consumption while the poor do not have  clean water, modern sanitation and proper refuse disposal systems which undermine the cities' general public health (Savage, Lin-Heng and Ofori, 2010). The authors submitted that "the continuing disparities of wealth and status in many cities in Asia will remain a challenge for the development of environmentally sustainable cities".

Furthermore, in Vietnam, the Governments effort to guide the country from a centrally-planned economy toward a market economy succeeded and made Vietnam to open up its economy to the rest of the world, thus making  significant progress and has since opened significant progress in the process of trade liberalization since 1989 (Anh and Ofori, 2010). The authors argued that while this has been successful in generating strong economic growth, it has created threats to the country's environment which can be seen in the degradation of the nation's environment in the areas of forest depletion, decline in biological diversity, soil degradation (marine and inland), water contamination, air pollution and the problems in solid and hazardous waste management and so on (Dinh, 2001 as cited in Anh and Ofori, 2010). With respect to the level of consciousness about environmental sustainability that most companies in Vietnam have, they have to some extent included environmental management

in their operations but they have not inculcated it in their overall management framework (Anh and Ofori, 2010). According to the authors, environmental management in Vietnam is not yet considered to be an issue which needs to be dealt with systematically. It follows from the forgoing that while the citizens are aware of environmental challenges and the need for creating a sustainable environment, their transformation toward making the environment sustainable remains unaddressed.

### 3.9.3 Europe

Europe is largely an industrial nation and the mere mention of the name is associated with high rate of greenhouse emissions. However, government and industries have been putting in place measures aimed at reducing greenhouse gas emissions, especially with the recognition of the dangers of climate change, carbon emissions and depletion of ozone layer. These measures have led to the reduction in the quantity of greenhouse gas emissions from some of the European countries. The UK for example is said to have been responsible for 15% of the cumulative emissions since 1750, but it is responsible for only 2% of current global emissions (Marland *et al.,* 2003 as cited in Broer, 2012). It was however, noted that these figures do not include carbon emissions from land use changes or from unsustainable use of forests, which also vary considerably by country neither were they adjusted to include the full global warming impact of carbon emissions from air travel, or the net effect of imported and exported goods, or greenhouse gasses other than $CO_2$ (Broer, 2012, p.31).

However, the fact remains that developed nations depends largely on energy that come from the burning of fossil fuels for their energy needs, and the UK is typical in this respect, deriving 90% of its total energy needs from fossil fuels (DTI, 2003b cited in Broer, 2012). The implication of this UK dependence on fossil fuels for her energy requirements is that she faces great challenge when it comes to drastic curtailments in energy use in order to reduce its effects on climate change. As stated by (Marland *et al.* 2003 cited in Broer, 2012), UK $CO_2$ emissions in 2004 were 556 Mt $CO_2$ (DEFRA, 2007a), and this contributes about 2% of the world's total emissions. With high energy requirements for UK industries and its implications on climate change, it is expected that universities in the United Kingdom will place high priority on teaching students to live sustainable lifestyle and engage in sustainable business activities. However, the UK is not alone in this high energy needs among Western

nations. Countries like America, Russia, China and so forth also depend much on energy from fossil fuel.

When per capita CO2 emissions from fossil fuels at Global level was considered, statistics showed that USA contributes largest amount of emissions, followed by Australia, UK. France, Mexico, China, while India, Bangladesh, Afghanistan in that order, contribute the least (Marland *et al.,* 2003 as cited in Broer 2012). Also, for 2005 emissions, Europe still ranks third, implying high ratio of carbon emissions contribution (see Figure 3.9):
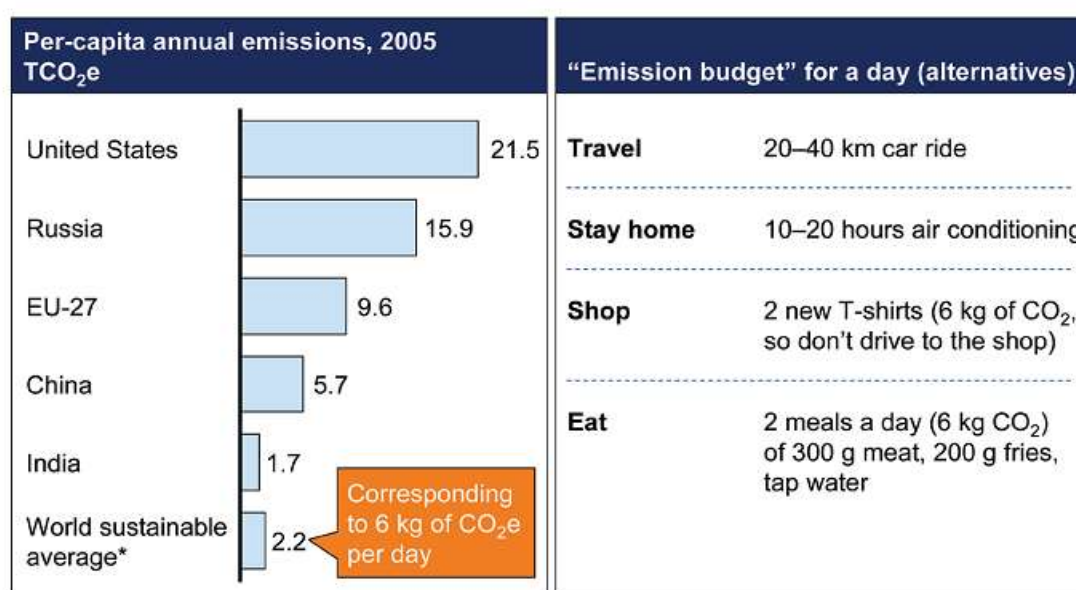


**Figure 3.9:** Current per capita emissions and world sustainable average emissions for 2050 to meet stabilisation levels of 550 ppm CO2e.

**Source:** Beinhocker *et al.,* 2008 as cited in Broer, S., 2012, p.34)

For both years, the global statistics failed to take into account the CO2 emissions of countries in Africa. In this sense, it cannot be said to be completely a global measure. It can however be said that most of the countries in Africa are not highly industrialised but this does not mean that they have zero fossil fuel consumption. Apart from indoor fossil fuel, the percentage of carbon emissions from fossil fuel in Africa is limited to the few countries where oil production takes place.

## 3.10 Role of Education in Transformation towards Sustainable Society

Education, especially at university level has been acknowledged as important for transforming the world to a sustainable place. Describing the different ways higher education including universities contribute to achieving sustainability, Foo (2013, p.6) stated that "Higher education is a unique intellectual contributor to society's efforts to achieve sustainability, through the practices of skills, consultancies, trainings, and exchange of knowledge. University researchers are the first alarms to alert the environmental challenges, and assist to spearhead a multidisciplinary of technical solutions". The awakening of higher education to join in the pursuit of sustainability started with the Stockholm Declaration of 1972 which was the early conference that addressed the issue of sustainability in higher education, and the interdependency between humanity with the environment (Foo, 2013). In particular, the role of education in transforming learners toward sustainable living was highlighted at the conference, which was the first world conference on human environment and development (Harding, 2006), where the relationship between education and sustainable development was first recognised on an international level (Calder and Clugston, 2002). This recognition was the real beginning of the move to deeply involve educators in enhancing sustainable development through teaching and learning. The Stockholm's Declaration focused on identifying ways in which universities, their leaders, lecturers, researchers and students can employ their resources in response to the challenges of balancing between human desire for economic and technological development, with the environmental preservation (Sohn, 1973 as cited in Foo, 2013).

In addition to the international recognition of the relationship between education and sustainable development at the Stockholm conference, the Tbilisi conference was convened with a focus on environmental education and how students could be educated towards sustainable living. The 1977 Tbilisi Conference came up with goals for providing students with opportunities to develop new behaviour pattern regarding sustainable living (Reid and Herremans, 2002). By implication, the Tbilisi conference recognised the potential transformative power of education when used as a tool for bringing about change. Education can be said to be at the root of change in every society. The changes that education bring about could come from the knowledge and skills learners acquire in the process or from association with others in a learning environment. This has been recognised and

acknowledge at various international world conferences (e.g., Tblisi, 1977 conference; Stockholm Conference, 1972, Brundtland Report, 1987).

As the need to involve educational institutions in the drive for creating a sustainable society increased in tempo, the Brundtland Commission came on board to further energise the drive. The World Conference on Environmental Education which produced the Brundtland Report (WCED, 1987) pointed out in the report that education was crucial for achieving a sustainable society and teachers were the instrument to be used for this. The idea of bringing in teachers into the picture must have been articulated by the Brundtland Commission to specifically assign the duty of teaching towards sustainable living to those whose primary assignment is linked with the preparing of the mind of future leaders and policy makers, educators and business moguls with the skills and knowledge for living and acting sustainably. Of course, the honest truth according to Rowe (2007) is that every students need to learn, through an interdisciplinary approach, not only the specific of our sustainability challenges and the possible solutions, but also the interpersonal skills, the systems thinking skills, and the change agent skills to effectively contribute to create a more sustainable future. The society is looking for this sustainability educated students as future business people, as employees, as consumers, innovators, government leaders and investors (Rowe, 2007).

In 1990, more than 300 universities in over 40 countries established the Talloires Declaration, a 10 point action plan for implementing sustainability and environmental literacy in teaching, research and operations at colleges and universities (UNESCO, 1990 cited in Foo, 2013). The role of education in enhancing sustainable development was also mentioned in chapter 36 of Agenda 21 at the turn of 1992 (Foo, 2013; Sedlacek, 2013). At the turn of 1992, the Agenda 21, a comprehensive programme adopted by the world leaders at the United Nations Conference on Environment and Development (UNCED), was revised in Rio de Janeiro to attain the sustainable development of environmental change (Foo, 2013). Those who participated agreed "that education has the potential to play a major role in the future realisation of a vision of sustainability that links economic well-being with respect for cultural diversity, the Earth and its resources" (UNESCO, 2007, p. 6 cited in Sedlacek, 2013, p.74). With regard to this, the UN General Assembly adopted resolution 57/254 and declared the period 2005-2014 as the Decade for Education for Sustainable Development (DESD) (Sedlacek, 2013). These initiatives made the universities that were signatories to the declaration to embark on voluntary and committed projects to incorporate sustainability into

their systems, make clear policies, goals and targets, strategic planning and time framework to achieve a sustainable campus (United Nations, 1993 cited in Foo, 2013). In support of this view, Wang (2013) stated that Agenda 21 was released at the Earth Summit held in Rio de Janeiro and in the subsequent twenty years, numerous initiatives were taken to integrated sustainable development concepts into university efforts planned to assist transform society from an unsustainable to a sustainable path. The principles proposed in Agenda 21 were formally given backing by international society, governments, and NGOs in the 2012, Rio+20 conference, and education for sustainable development (EFSD) was acknowledged as the key path to the transformation of society to sustainable development (Wang, 2013).

The use of education for transforming the society to a sustainable place is to be accomplished by educator's transforming their course and curricula in order to engage and empower students to learn and apply new  sustainable development (SD) oriented concepts, paradigms knowledge, and wisdom to achieve the necessary societal transformations (Wang, 2013). According to Agenda 21 and the reaffirmed perspective of Rio+20, Education for Sustainable Development (EfSD) is still the central avenue through which that transformation is to be accomplished (Wang, 2013). On the whole, universities have played key roles in transforming society by educating decision-makers, leaders, entrepreneurs and academics (Cortese, 2003; Elton, 2003 cited in Anon, 2013).  However, in several ways, they have continued to be very traditional (Elton, 2003 cited in Anon, 2013) by contributing to and even increasing unsustainable ways of development (Sterling and Scott, 2008; Wals, 2008 as cited in Anon, 2013) and by resisting changes (Anon, 2013). The result of this resistance to changes is the perpetuation of the Newtonian and Cartesian approaches which though have been beneficial to society in several ways, the approach has focused mainly on the conquest of nature and the industrialization of the world, thus, producing unbalanced, over-specialised and mono-disciplinary graduates (Cortese, 2003; Costanza, 1991; Orr, 1992 and Weenen, 2000 cited in Anon, 2013). This is perhaps the result of the different approaches to sustainability education.

However, by teaching and educating students on the specifics of the world's sustainability challenges and the possible solutions to the problem, the different segments of world population have not been directly educated on the same issue. The impacts of educating students towards sustainability may only have greater effects on world population if the educated students play the role of agents of change. In this respect, it is the responsibilities of

graduates from university to inform and share their knowledge and skills with those who do not have access to sustainability education. In this way, according to United Nation Educational, Scientific and Cultural Organisation (UNESCO, 2013), Education for Sustainable Development allows every human being to get the knowledge, skills, attitudes and values needed to shape a sustainable future.

Education and learning should serve as the key to the development of the behaviours, attitudes and actions required by humankind to live sustainably. In support of this view, UNESCO stated that "Education at all levels and in all its forms constitute a tool for addressing virtually all global problems relevant to sustainable development" (UNESCO cited in Brandt-Rau, 2010, p.7). This implies that in the transformation of learners towards sustainable living, education plays significant role. Brentford (2009) agreed with this when he stated that the higher education sector is the place minds capable of bringing about change are trained and developed. This training is important in several ways. In one respect, the world needs people who will help educate other minds on sustainability issues. In another respect, the students are the leaders and policy makers of the future. So, they need the knowledge and skills to address the problems they will meet in the world. Lending credence to this view, the Higher Education Council for England (HECFE, 2009) noted that graduates are entering a volatile world and university needs to respond to challenging, rapidly changing socio-economic environmental conditions.

In addition, Sterling (2011) stated that if the sustainability transition means that there should be immense and fundamental changes in society, it follows that education and learning so often identified as the key agents of change need to bring about a change of parallel scope and extent. The change in scope and extent which education is expected to foster involves the transformation of learners in such a way that could lead to the transformation of society. In this regard, Daloz (1990) argued that higher education possess the power to plant the seed of conscientization, understanding, insight and transformation by enhancing proactive thinking in the learners, making learners develop multiple perspectives, and encouraging dialogue and construction of knowledge. Also lending support to this view, Glisczinski (2007, p. 320) stated that "Institutions of higher education are uniquely positioned to facilitate transformative experiences in learners, who may, through critical examination of the norms within their environment, develop heightened consciousness of their conditions. Actualizing

higher education's mission objectives is a powerful counter-hegemonic response to the poverty of understanding in… society".

It follows that the knowledge and skills for living sustainably could be gained through good education. Supporting this view, Chalkley (2006) said that Higher Education's most valuable contribution to sustainability lies in providing large numbers of graduates with the knowledge, skills and values that help business, government and society as a whole to progress towards more sustainable ways of living and still ensure steady economic growth. However, no form of education can be transformative without finding it root in basic education. Basic education is a fundamental requirement for the acquisition of general knowledge necessary for advancing the learners knowledge in global issues. In support, Franz Furedi cited in Wegimont (2013) in a forward argued that although we need to make sure that education prepares young people to yield to new experiences, in a confident and intellectually curious manner but the capacity to engage with change requires that they have intellectual foundation which is most effectively communicated through subject-based teaching.

On the other hand, transformative global education could be policy-driven and motivated by transformative and sustainability agenda. In the words of Wegimont (2013), those involved in Global Education have come to the conclusion regarding the change that is needed in education that it is not immodest to argue that good education must be, good Global Education. Global Education main objective is to shape the future of the society and make it a better place for all to live by educating people using global education approach to understand people from other cultures and share views on global issues with them, ensure the development of sustainable society and work towards ensuring peace and social justice through ethical behaviour. These areas where Global Education engages learners indicate that one of the objectives of Global Education is the transformation of learners towards sustainable living. If we understand sustainability to mean that humankind need to live a lifestyle that will make it possible for the present generation of people on earth to satisfy their needs and still give the future generations the opportunity to also live and satisfy their own needs, then education must be capable of shifting the minds of learners and their knowledge base away from any lifestyle that does not acknowledge the need to live sustainably. Therefore, the development of global mindedness in the learners cannot be ignored by any

education system that is sustainable. And no education system can develop global mindedness in the learners without the approach being transformative.

The educated mind perceives and sees things differently from the uneducated person. This different way of seeing the world can either be used to harness sustainable development by making people to live within the carrying capacity of the earth or to create unsustainability by exploiting the resources of the earth beyond its carrying capacity. For instance, by engaging in business activities that endanger biodiversity that provides life support for all living things, human beings contribute to sustainability crisis. However, learning that can guarantee sustainable living is dependent on the scope of application of what is learnt and depth of understanding. Learning outcomes that have wide applications and involves a deep form of exploring reality such as dialogue and negotiation of meaning between the educators and learners (transformative learning) has a greater potential of changing the learners attitudes and behaviours. Reaffirming this view, Lynette (2009) noted that learning that takes place within a self-contained education setting does not guarantee wider scope of application of what is learnt but is more of learning for the sake of learning.

The power to apply learning flexibly to experiences is dependent upon deepening the negotiation of meaning, engaging in a dialogue and questioning ourselves about our core beliefs, not just our understanding of the complexities of lived experiences (Cunliffe and Jun, 2002 as cited in Lynette, 2009). This view was confirmed by the findings of the studies conducted by Baumgartner (2001) and Grimmett (1989) as reported in Lynette (2008). The authors found that deep transformative experiences which come from psychological/cognitive and contextual/socio-cultural approaches to learning, are more likely to be more widely significant and effective long term coverage of broad curriculum. This suggests that education plays a role in the transformation of learners. Stressing the role of education in creating a more sustainable world, Sterling (2011) stated that the key to creating a more sustainable society is learning. He argued that learning brings about the change of mind on which change towards sustainability depends and the difference of thinking that determine whether humanity can create sustainable or chaotic future rest on. The author stated that what will determine the direction of this change, whether the society can move towards or further way from ecological sustainability is the qualities, depth and the form of learning that takes place now and in the years ahead.  In order to ensure that education and learning does not

take the society to a destructive path, several efforts, both at group and individual levels, have taken place at global and regional levels (e.g. 1972 Stockholm conference, 1977 Tbilisi conference, WCED, 1987).

However, some studies carried out in the area of students' perception and development towards global society (e.g. Ashbrand, 2008, Bertelsmann Fundation, 2007, ABS, Roczen and Klieme, 2007) showed that teaching of students alone is not enough to make them live a sustainable lifestyle and have respect for global society. The students need to develop some personal qualities. Ashbrand (2008, 2009 as cited in Scheupflug and Uphues, 2013) investigated the orientation patterns of students with respect to global society in various didactic settings, and arrived at the conclusion that self-determined personal engagement and non-moralised action contribute to the development of non-paternalistic, ethically reflective and cohesive view of the world society. Also, according to Scheupflug and Uphues (2013), a number of studies substantiated the significance of personal experience of active participation and self-efforts to live sustainably (e.g. BERTELSMANN FOUNDATION, 2007, ABS, ROCZEN and KLIEME, 2007) whereas Ashbrand (2009) and Andreotti-Souza (2013) as cited in Scheupflug and Uphues (2013), studies showed that participation alone is not enough, but that it must be closely followed by self-reflection. I share the views expressed in the findings of these studies. More importantly, the studies showed that Global Education plays some roles in developing the learners to respect the global society but this needs to be supported with self-determined personal engagement and self-reflection. Respect to global society implies living sustainably: taking care of the environment, managing available resources in the ways they can serve the present and the future generations, living in peace, understanding other peoples' cultures and respecting them, and so on.

In addition, studies showed that a focus on Global Learning content alone does not lead to expected results like non-paternalistic, justice-oriented attitudes and behaviours (Scheupflug and Uphues, 2013). The authors, therefore, suggested that a pedagogical posture of recognition for the learners, and opening up spaces for learning could be fundamental to the transformation of learners' attitudes and behaviours. Such transformation could help learners to overcome the challenge of learning to live differently. In support, the Director-General of UNESCO, Matsuura (2007, p.5) in a round table conference stated that "The question of sustainability presents a challenge of learning how to live differently…It certainly involves

asking how we are to raise the next generations with values, attitudes and understandings different from our own". The type of thinking that could enhance the learners' capacity to ask questions that seek answers to how to produce the next generations of people with sustainable values must be the thinking pattern that establishes in peoples' minds the interconnections between how our present style of living could affect the future generations of people.

Matsuura (2007, p.5) saw the necessity to educate the young ones on how to live sustainably. In his words:

> "We must call upon the young to think of the needs of future generations and to take better care of our planet. Education is key to this. But the issue is not just one of putting education for sustainable development into the curriculum and teaching materials, important though this is. It is also about cultivating capacities of critical understanding, careful analysis, respect for others and forward-thinking, capacities, which enable people to reflect upon and change their behaviour, values and life-styles".

It can be seen from the above statement that education for sustainable development goes beyond just testing learning outcomes for the purpose of passing exams. It goes to the root and purpose of learning, which is to transform the learner to live a life that is meaningful both to the individual and to the society. Matsuura (2007, p.5) said "It is here that ESD intersects with issues concerning the quality of education, which is not just about learning outcomes, but also about the very purposes of education".  The researcher believes that the very purpose of education is to impart transformative experience in the learner with a view to making the learner use the experience to change his/her way of living and make the society a better place to live.  Putting what is learnt into action or what Pugh (2011) called motivated use of school content transforms theoretical knowledge into practical value for the benefit of the society. Pugh (2011) stated that motivated use specifically involves the application of school content in a context (particularly out of school contexts) where application is not needed. The ability to apply the knowledge and skills acquired in school outside school contexts makes such knowledge and skills useful for solving complex problems in the society. Motivated use or active use (AU) is defined by Heddy and Sinatra (2013, p.724-725) as "seeking opportunities outside the classroom when it is not a requirement". For example, if a student learns about sorting of domestic wastes for recycling and goes home to practice it, this would be an example of AU (Heddy and Sinatra, 2013).

The power of education to bring about change in learners will depend much on the content of what is taught to the learners and how it is taught. It is not enough to assume that education will bring about change in the learner without considering the needs of the society and making conscious efforts to include such need as part of what should be taught in school. Supporting this view, Sterling (2011) argued that education is not a simple instrument of change although good education always brings change in the learner. Good education in the view of the researcher is education that is relevant to the needs of the learners and the society. In this era of sustainability crisis, Sterling (2011, p.19) stated that "Engaging education fully in the transition to sustainability requires critiquing much current thinking and practices, also visioning and designing a credible and practicable alternative – whether you are a policy maker, a lecturer, teacher, community educator or parent". The author argued that education for sustainable development within the framework of education paradigm that is mechanistic can only meet with limited success. He, therefore, suggested that what the society really needs is to change from transmissive to transformative learning. In this regard, it is the responsibility of all educators to provide students with education that can provide them the opportunities to become good environmental citizens, not only as consumers but also as providers of environmentally responsible goods and services (Reid and Herremans, 2002). This implies that transformation of students is largely the duty of educators.

However, the transformation of learners through education cannot come without visioning educational innovation as transformative learning platform for ecological consciousness that catalysis systemic change for s sustainable future by transforming traditional approach to curriculum and instruction (Taylor, 1998). While the researcher shares the view that transforming traditional approach to curriculum and instruction are important ways of making Global Education field transformative, it is important to point out that Taylor (1998) failed to recognise that it is as well important to ensure that instructors must be equipped with the necessary skills and traits for imparting sustainability education on the students. This is important because teachers who teach global issues in school have strong influence on what learners learn. In support of this view, Scheunpflug and Uphues (2013) stated that studies carried out by Merryfield, Lo, Po and Kasai (2008) which investigated the approaches of teachers in Hong Kong, Japan and United States who were successful in fostering global consciousness in their students showed that those teachers were aware of global connections. They were also interested in global issues, capable of changing perspectives, had a greater

awareness of implications of personal biographies, of stereotypical viewpoints and of otherness as well as had international experience (Scheunpflug and Uphues, 2013).

In another perspective, the nature of the society has significant impact on the role Global Education could play in the transformation of learners towards sustainable living. Societies differ in terms of the level of social, political and economic stability in one hand and the knowledge level of the people in the other hand. In a society that desires to live sustainably, it is of high importance to think of education as a means to equip people to participate together as global active citizens, providing safeguard against dogmatism and fundamentalism that may lead to confusion, disenchantment with formal political processes and increased violence (Andreotti, 2013). The author stated that in this regard, Global Education is central to human development. On the other hand, in the context of knowledge society, Andreotti, (2013) argued that Global Education needs to recognise the shifting profile of learner, learning, and knowledge. This recognition should lead the societies to come up with the right pedagogical responses that support learners to develop global mindedness through critical and transnational literacy that can enable them to engage with the assumptions and implications of multiple viewpoints and empower them to shape and exercise their agency in informed and ethical ways (Andreotti, 2013).

Paradoxically, the gap between society dominated by crises and knowledge society is beginning to close as a result of globalisation. With the development of a world that is now a global village, the assigning of different roles to Global Education in each of the societies is no longer of much significance. The world is now one large village and the crisis in one part of the world affects the rest of the world in one way or the other. Similarly, knowledge pervades the world and therefore, no any part of the world can still be regarded as a knowledge society. However, some parts of the world are more developed than the other but this does not insulate them from global issues like the crisis of sustainability. Under this circumstance, the roles of Global Education have no boundary, more so when learners from different cultures come together under Global or International Education to study in the same classroom. In this sense, it could be argued that the division of the world into knowledge society and crisis dominated society is now blurred.

In addition, Global Education is currently an integral part of every education system and cannot be regarded as separate and isolated. Hence, it does not focus attention on addressing issues based on the characteristics of a particular society. That is, no society can be said to be so backward again as to make it impervious to the influence of global education. Supporting this view, Wegimont, O'Loughin and Hartmeyer (2013, p.2010), said that "Global Education has moved from being movement extrinsic to education systems, towards a situation where it is intrinsic to education system." This implies that education in all parts of the world has global features and therefore, all students, no matter the society involved, has access to global education and its agenda of educating learners to embrace sustainability, peace, social justice and so on.   However, the success of Global Education in transforming learners to live sustainably will depend on what universities are doing with respect to the management of the ecosystem, biodiversity, and climate change as well as curriculum contents and approaches to teaching and learning.

In the management of ecosystem, it is argued that many universities are engaged in campus greening aimed at providing students with practical knowledge and avenues for participation in sustainable practices. Buttressing the growing culture of campus greening in the universities around the world, Beringer (2007) said that sustainability in higher education has of recent begun to increase in importance, and becoming more critical for higher education institutions to the extent that greening the campus has now entered mainstream. This greening exercise provides students the opportunity to take part in a more practical way on developing and creating a sustainable environment. In support of this view, Kagawa (2007, p.320) stated that greening of the campus enables active student participation in decision making and student-led sustainability projects on campus and creating a sustainability-oriented pedagogy of place. Also, the G8 University Summit in Sapporo (2008) noted that by greening the campus, universities provide venues in which to test new sustainability-relevant knowledge in a social context. However, campus greening practices cannot be said to be a sufficient way of making learners to acquire the knowledge and skills required to live sustainably. Campus greening is a mere environmental science exercise. Thus, it might not be of much help in transforming learners towards sustainable living.

With regard to the relevance of Global education in the development of positive values in the learner, Bliss (2010) explained that global education emphasises the development of positive values and attitudes, based on a strong sense of identity and self-esteem and include caring for others, recognising responsibilities, a commitment to upholding the rights and dignity of all people and an appreciation of diversity and difference. It also encourages and empowers learners to translate their knowledge, skills and values into a preparedness to participate actively in community life and at the same time it is important that students develop a realistic awareness of how effective such action and participation will be (Bliss, 2010). All these involve a shift of paradigm from education that informs to education that transforms the learner holistically.

With respect to curriculum content for sustainability education under Global Education field, content appreciation is viewed as vital for making learners interested in learning about sustainability. Brophy (2008a) generally defined content appreciation as "developing value for the content and coming to view the learning process as a worthwhile endeavour". If the course contents taught at university are not appreciated by the learner, there is no likelihood that it can transform students to live sustainably.  To appreciate the content of what is taught means that students are able to see the importance of the contents in their personal growth and development and the value of such contents in the realisation of their future prospects. Supporting this view, Heddy and Sinatra (2013) stated that experiential value (EV) is reflected by a student who comes to appreciate material for its ability to change his or her experience of the world. For instance, if the student values the concept of sustainability because it makes him or her appreciate the connectedness between human activities and how what happens in one area impact on every area of life on earth, then he or she has gained experiential value (Heddy and Sinatra, 2013). It follows from the forgoing that course content is significant for transforming learners if it is used to inculcate experiential value in learners. Pugh (2011) explained that experiential value refers to the valuing of content for the experience it provides and it involves attachment of additional meaning to those aspects of the world more fully perceived and to the concepts that brought about the expansion of perception. In support of this view, Pappas (2012) suggested that university needs to develop values-based sustainability content for classes across disciplines, address the careful assessment and evaluation of both human and technical factors as a springboard for solving sustainability issues.

However, it is not just developing value-based content that matters. A value-based content can fail to achieve the needed transformation of the learner if value is understood to mean and, or defined as acquiring knowledge and certification in order to get good employment. Brophy, (2008a, p.133) made this point clear that one of the problems with research on motivation is that value concepts tend to be defined in ways that limit their applicability to learning situations because the definition of valuing mainly focus on utility value (e.g., engaging in an activity to acquire a skill or certification that is needed to advance one's career goals). He noted that researchers in this area rarely emphasise experiences such as the satisfaction of achieving new insights, aesthetic appreciation of the content or skill, or awareness of its function in improving the quality of our lives (Brophy, 2008a). The problem with the way students' value content therefore is that there is a general tendency to value content from the utility perspective. This leaves out the equally important aspect of valuing content based on its ability to improve the quality of human life and relationship with the ecosystem. This one sided approach to valuing of content could deprive learners from gaining experiential value from content appreciation.

## 3.11 Holistic Approach to Teaching Sustainability

The British Environment and Development Education and Training Group's (EDET Group) report entitled *Good Earth-Keeping: Education, Training and Awareness for a Sustainable Future* defined the nature of education for sustainable development as a process which is relevant to all people and that, like sustainable development itself, Education for Sustainable Development (ESD) is a process rather than a fixed goal (Sterling/EDET Group 1992 as cited in Fien and Tilbury, 2002). The group said that "It may precede – and it will always accompany – the building of relationships between individuals, groups and their environment. All people, we believe, are capable of being educators and learners in pursuit of sustainability" (Sterling/EDET Group 1992, p. 2 as cited in Fien and Tilbury, 2002, p.9). This definition suggests that working towards sustainability is a collective responsibility and every individual is capable of being part of the movement. However, how people approach the pursuit of sustainability may differ.

In its report, the EDET Group confirmed the validity of the different approaches to environmental education in achieving sustainable development (Fien and Tilbury, 2002). It

will not be enough to simply adopt the same approach used in teaching environmental education to teaching sustainability education aimed at making learners understand how to relate with the environment and protect the planet from the threats posed by climate change, pollution, deforestation, environmental degradation and depletion of resources. In support of this view, Tilbury (1995 and Fien, 1997 as cited in Fien and Tilbury, 2002) argued that education for sustainability must differ significantly from much of the way studies carried out under environmental education banner is done. Clarifying on what the approach to the teaching of education for environmental sustainability should be, Fien and Tilbury (2002) stated that "Education with the objective of achieving sustainability varies from previous approaches to environmental education in that it focuses sharply on developing closer links among environmental quality, human equality, human rights and peace and their underlying political threads". Hence, in education for sustainability, issues of environmental quality and human development are central (Fien and Tilbury, 2002). This implies that education for sustainability needs to develop learners to understand how to handle issues such as food security, poverty, sustainable tourism, urban quality, fair trade, green consumerism, ecological public health and waste management as well as those of climatic change, deforestation, land degradation, desertification, depletion of natural resources and loss of biodiversity which are the major concerns for both environmental and development education (Fien and Tilbury, 2002).  These concerns according to the author differ greatly from those of litter, nature study and planting of trees in the school grounds and other aesthetic work that has always been the focus of much school-level environmental education in the past.

Furthermore, the teaching approach used by higher education teachers aims at producing "a set of prescribed outcomes that, in the judgement of teachers, by and large, this cohort of students should aspire to" (Mann *et al.,* 2013, p.91). In this approach, the expected learning outcomes generally relate to knowledge and skills instead of to affective or dispositional outcomes (James and Brown, 2005 as cited in Mann, *et al.,* 2013). The result of this approach to teaching and learning is the possibility of producing students who are 'too academic', and graduate with the impression that knowledge is all about developing theories and models. Many of these theories and models are hardly useful in solving practical problems. It is the view of the researcher that what we need is not theory tutored students but students mentored to have love for the planet and have interest of the future generation in mind. This could be achieved with affective learning. However, the problem is that it is not easy to focus on affective outcomes (values, attitudes, dispositions and behaviours) because teachers have

little or no clues about the values and attitudes of students groups against which they could base rational teaching decisions (Shephard *et al.,* 2009b, as cited in Mann et al., 2013), and they assume implicitly or explicitly, that the student group is effectively homogenous (Mann *et al.,* 2013. The authors argued that if teachers have insight about the values and attitudes of their student group, even if it is hypothetically, they could design learner-support programmes that would respond to the needs of subsets of the cohort (Mann *et al.,* 2013). However, even if it is possible for teachers to treat learners as individuals or even as small sub-set of a larger group, it is argued that this will place greater demands on the already hard-pressed higher education teachers (Mann *et al.,* 2013). So, if the burdens of teaching in the affective domain, which is in itself a highly controversial issue in higher education, is added to the workload of higher education teachers, it is clear that in some context, that may be posing an impossible challenge to many higher education teachers (Mann, *et al.,* 2013). Under this condition, an alternative paradigm is needed. In this regard, this study sees a holistic approach as the most viable approach for teaching about sustainability in higher education institution and bringing about transformation in the lifestyle of learners.

A holistic approach will use whole system learning to engage learners head, body and mind. Whole system learning, for example, will produce a whole person. The traditional approach to teaching that is merely informative and the approach to teaching that is transformative do not have the same potential to change the learners' attitude. Although both the traditional approach which is more instrumental in nature and the transformative approach that is more emancipatory is a way of educating students to develop the knowledge and skills required for personal development and changed lifestyle, the latter has been identified to be relevant to attitude and behaviour change. Thus, Wals and Jickling (2002, p.225) said that if we juxtapose more instrumental views of 'education for sustainability' with more emancipatory views of 'education for sustainability' we can imagine, on the one hand, an eco-totalitarian regime which through law and order, rewards and punishment, and conditioning of behaviour can create a society that is quite sustainable according to some more ecological criteria. The emancipatory view of education for sustainable development encompasses a system thinking approach which aims at transforming the whole person.

The use of system thinking approach involves the whole person in the learning process and also covers different interconnected aspects of sustainability. In the teaching of sustainability

at the university, the system approach covers five contexts: social/cultural, economic, environmental, technical, and individual. It is therefore holistic. Supporting this view, Pappas (2012) noted that this approach is realistic and important to researching and teaching sustainability in the university. However, the problem with this conclusion is that an approach to teaching that is said to be holistic on the bases that it involves different categories and groups in the implementation of sustainable policies is still not holistic in the true sense. A holistic approach involves the body, the head and the spiritual aspects of being. The mind/body/soul/spirit or however the elements that make up a whole person is conceptualised which matters in the end, is in part, an element of the strenuous inquiry all learners have to be willing to undertake as part of the processes of learning in a more engaged way (Taylor, 2007).

Furthermore, as noted by Mulder (2010, p.82) "university education is not about implementing norms and values into the minds of the students…especially the norms of taking responsibility for future generations and the poor by the authority of the lecturer". To do so will amount to authoritarianism and education is not about authoritarianism. It is a democratic process that sharpens the mind of the learners to reason and question the why, how and what of any issue. In this way, education could be used to groom up critical minds that can think independently from the general knowledge gained from exposure to normative values in society. According to Mulder (2010, p.82) "University education is about sharpening critical minds that are able to make balanced appraisals of their subjects of choice and the norms and values to use in this appraisal". Although it is difficult to engage in value-free teaching especially when it involves a subject matter that requires advocacy such as sustainability education, teachers need to be aware that message that is value laden is likely to be rejected by the students. Students in the university are developed minds and can decode when a message is being pushed down their throat by the authority of the teacher.

Similarly, compelling learners to take sustainability education as important without doing the groundwork to prepare their minds to see for themselves the need for living sustainably is unethical. Educators on sustainable development are advised to engage students on ethical issues in the area of sustainability as a way of enhancing the development of ethical values in the student. Thamos (2009) recognised this and called on sustainability educators to focus on

ethical engagement, the processes of critical analysis, and the application of holistic approaches to the teaching and learning of sustainability as a way of making it to be more value oriented. Underscoring the importance of the holistic approach to the teaching and learning of sustainability, Tilbury (2004) stated that the three terms: critical reflection, values clarification, and participative action have become common components of environmental education for sustainability. She explained that these approaches provide opportunities for students to engage in critically reflecting upon the basis of their socio-cultural values and assumptions; to identify how they are conditioned and confined by the socio-cultural structures they are operating in and, more importantly, to build their capacity as agents of change. Reflective thought and action is the underlying framework for sustainable living (Organisation for Economic Co-operation and Development, OECD, 2001). Action is the fulfilment of reflective thought.

The ideas shared in the classroom and reflected upon by a student will only have impact on the environment if it is put into action. The classroom does not provide opportunity for enough practice. In order to make more meaning out of sustainability education that takes place in the classroom, Moore (2005, p.80) said that "educators need to find a way to practice the ideals of sustainability within our classrooms so that teachers and learners can experience what sustainability feels like". This implies that an alternative way of teaching sustainability in the classroom to allow for gaining of practical experience should be sort. In this respect, Moore (2005) argued that by changing the practice in classroom, it is possible for transformation to occur for individuals, organizations and systems. The author however, failed to suggest the approach to teaching of sustainability in the classroom that will provide the learners with opportunity to practice it. The classroom is different from the real world. In many cases, the theoretical perspective of sustainability that students are exposed to within the classroom and the change of attitude required of them do not come to fruition because the theories do not provide sufficient shift in consciousness to make the learners personal engagement with the real world strong enough.

The importance of learners developing personal engagement with their world depends on the power of such engagement to make the learner reflect on their experiences of the real world, question assumptions and beliefs and perhaps, realise the need for change. Seeing the need

for change is the stepping stone to transformation. Transformation is personal and cannot take place without personal engagement with reality. In support, Taylor (2007) stated that in order to generate meanings that are not merely subjectively appealing, but which also have social weight, personal impact and can help make the circumstance of people more useful both to themselves and those around him, the development of real (authentic) personal engagement with the learner's real world is important. In addition, when learners develop personal engagement with the real world, they become aware of the problems and challenges therein. And in the process of trying to find solution to the problems and challenges, they learn from past experiences by engaging in critical reflection. In addition, through the sharing of views in social group where rational discourse plays significant transformative role, learners could experience transformation. The researcher considers experience, critical reflection and rational discourse as vital for transformative learning to take place.

## 3.12 Challenges to Sustainability Education at University

The literature on sustainability education shows that universities are making progress in sustainability education (e.g., Beringer, 2007; Mcdonald, 2012; Sterling and Scott, 2008; Sapporo, 2008). However, there are some issues that still pose challenges to universities engaged in education for sustainable development. These problems range from lack of understanding of what sustainable living in a dynamic society entails to conflicting interests of large number of personals in the university. With regard to lack of proper understanding of sustainable living, Wals and Jickling (2002) said that we do not really know what the right sustainable way of living is and even if we would, it would be largely different from situation to situation and be likely to change over time as circumstances continuously change. However, there are some common features of sustainable living which I believe are not culture, time and context bound. In all cultures and context and at all times, individuals and organisations could be said to be living sustainably if their present way of dealing with the economic resources and the environment is premised on their own survival and the need for the future generations to still have resources to live on and have the right to healthy environment.

Also, in many cases, it has been found that many of the university academics and leaders do not understand the reasons for pursuing or implementing sustainability actions. Supporting the lack of understanding shown by some university leaders and academics, (Sterling and

Scott, 2008, p.390) said that "The idea of ESD as such is not well understood compared with the need for environmental management or the importance of research". Major among the causes of the resentment is that the pedagogic implications of education for sustainable development (ESD) are problematic, more so as most academics do not have an educational theory background in this area; secondly, some are resistant to what they might see as experiential, open-ended and ethically risky teaching and learning approaches (Sterling and Scott, 2008, p.389). Obviously, the introduction of a course that will cause many teachers to go for retraining is likely to be resisted by many. Under this circumstance, some of the universities that introduce education for sustainable development make use of teachers that are perhaps not trained in sustainability education. The consequences of using such ill prepared teachers are among others their inability to make students see the underlying needs for living sustainably.

Furthermore, the role of universities in enhancing sustainability is complicated by the large number of personnel that have a stake in what each university is doing. Universities are largely comprised of four personnel bodies – students, faculty, staff and alumni – each of who have different, and sometimes competing priorities in terms of sustainability (Krizek, Newport and White, 2012). The implication of having chains of interest groups is that while some people will show interest towards making sustainability education a core area in university education, some others who may feel threatened by the move will either show lukewarm attitude or indirectly keep working against the initiative. As a result, although there have been several world conferences on sustainability followed by declarations that called on universities to be fully involved in sustainability initiatives, the issue of pursuing sustainability programmes in universities remains daunting. Supporting this view, Clugston and Calder (1999, p.3) argued that "with or without the Talloires Declaration as a guiding set of commitments, the obstacles to transforming higher education are daunting". According to the authors:

> "The modern university is the embodiment of the mechanistic, utilitarian worldview that shaped the scientific and industrial revolutions. Cartesian dualism (separating pure from applied, objective from subjective); Baconian method (emphasising manipulation, control, and quantitative measurement); and utilitarian philosophy shape academic functioning. The academy is also deeply involved in providing expertise for an "unsustainable" world economy".

In addition, the level of autonomy many universities in the world enjoys makes it difficult to have a centralised control that could make every university to adopt education for sustainable development. The implication of this non centralised control of universities is that universities are at liberty to choose whether to introduce sustainability education into their curriculum or not. In Nigerian universities, for example, it is within the powers of the course leader to plan the curriculum and course contents. Therefore, if the course leader is averse to sustainability education, it is put on the margin or not taken note of in the curriculum. Similarly, under the English system, higher education institutions (HEIs) hold and safeguard a considerable degree of autonomy at least as regards their curriculum and course provision and this traditionally makes them resistant to direction from central government as regards the orientation of their teaching and learning practices (Sterling and Scott, 2008). As a result, the mainstreaming or embedding of ESD in English higher education (HE) is a complex, largely decentralised, and multi-stranded process undertaken by disparate groups of academics variously involved in raising the debate, developing policy and theoretical frameworks, networking, influencing peers, using existing funding opportunities, researching, disseminating, working with professional bodies, and so on. (Sterling and Scott, 2008).

Also, there is epistemological error in our education system that encourages a world view that is not in tandem with the principles of sustainability. In this regard, Sterling (2011) argued that the linear idea that sustainability education would change people and thereby, would change society ignores at least three things:

❖ education for change is usually dominated by the larger educational system under which students are trained for vocational roles and which imparts socialising roles and purposes and can cancel out radical educational endeavour;

❖ the larger educational system that is still in place affects and shapes the educational system more than the way sustainability or environmental education impact on the learners and therefore the society, although the two are in a dialectical relationship;

❖ in an era of mass communication, the socio-cultural milieu arguably affects the way people behave and influences values more than formal education.

These limitations do not however, imply that education for change movement cannot achieve its goal. They could be effective but these factors impose certain level of limitations on what can be achieved through the movement.

However, in spite of these obstacles, many higher institutions are engaged in integrating sustainability across the institution by transforming disciplines, operations, and research at both the national and local levels (Davis, Edmister, Sullivan and West, 2003). Such integrations while not completely sufficient to completely reverse the unsustainability crises, could go a long way towards transforming students of higher education to live sustainably. In addition, Karatzoglou (2012) said that there are a number of suggestions on how universities tackle the issue of transformation of students towards sustainable living. According to Karatzoglou (2012), the major suggestions on how universities can go about tackling the issue of transformation of learners towards sustainable living and creating a sustainable society include a change in management practices in the area of recycling, energy efficiency initiatives, or the implementation of an environmental management system; promotion of integration, synthesis, critical reasoning, and system thinking skills; supporting students and researchers beyond skill development to meet up with the future multidisciplinary complex challenges of sustainability. Others are taking up a leading role in coordinating, promoting, and enhancing the engagement of local authorities and other stakeholders in the society to design and implement regional sustainability plans by acting as sources of technical expertise; evolving a new research and teaching agenda for universities as centres of development of the sustainability scientific field defined by the problem it is expected to solve (Karatzoglou, 2012).

In conclusion, this review revealed gaps in previous studies. It was found from the literature reviewed that research in the areas of sustainability and transformative learning abound but very few studies have been done in the area of global education. Also, in the area of sustainability, previous studies concentrated on the consequences of unsustainable ways of living and how these could affect the future generations. Some of the studies examined the contributions of higher education institutions to addressing the issue of sustainability. However, only few studies attempted investigating the changes in the attitudes and behaviours of learners in response to what universities are doing to transform learners towards sustainable living. In the next chapter, the research methodology is discussed. The

method employed for the study was the mixed method research. The chapter explained the reasons for using the mixed methods. It also explained the research design for this study and how the design helped in achieving the objectives of this study.

# Chapter Four

# Research Design: Methodology and Methods

## 4.1 Introduction

The first three chapters of this thesis presented the research aims and objective as well as the conceptual and the theoretical foundation of the study. It also reviewed some relevant literature on sustainability, global education and transformative learning. This chapter explains the research methods used in this study. After the introduction, some philosophical foundations located in mixed methods research are explained. Also, the rational for using mixed methods and the methodological design are also discussed.

## 4.2 Research Philosophy

The worldview and basic beliefs of any researcher are underpinned by the researcher's theoretical perspective or research philosophy. Such theoretical belief underpins the research strategy and the method(s) a researcher employs to carry out a study. This should be made clear at the beginning of the investigation. Making the researcher's philosophical position clear at the beginning of an investigation is important in order to help put the readers of the work in the right perspective within which to take their stance in the judgment of the research results. By making the readers to understand the researcher's ontological view of reality, the possibility of readers committing error of judgment based on a different view of reality could be reduced to the minimum. Therefore, answering the ontological question, "What is the form and nature of reality and, therefore, what is there that can be known about it," (Guba and Lincoln, 1994, p.108) is the first thing to explain in the definition of how researchers can approach a research problem (Andrade, 2009). In this study, the researcher adopted pragmatism as the research philosophy. Pragmatism is a research philosophy in which the researcher combines both the qualitative and quantitative methods in one study. This sort of combination of research methods gives rise to the mixed methods research. Pragmatism as a research philosophy emerged from philosophical debate between quantitative and qualitative purists. This research philosophy has become the hallmark of mixed methods research.

Mixed methods research is defined by Johnson, Onwuegbuzie, and Turner (2005 cited in Collins, Onwuegbuzie and Sutton 2006, p.69) as "the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language in a single study or set of related studies". Generally speaking, mixed methods research is an approach to knowledge (theory and practice) that attempts to take into account multiple viewpoints, perspectives, positions, and standpoints (always including the standpoints of qualitative and quantitative research) (Johnson, Onwuegbuzie and Turner, 2007).

The mixed methods research is more than simply combining the quantitative and qualitative techniques in a study. It goes further to give the researcher more holistic information in the way that the use of either qualitative or quantitative method might not do. This holism inherent in the mixed methods makes the design itself systemic. The systems thinking approach is a good approach to finding solutions to the complex human problems we face today. For example, a hydra headed problem like the sustainability crisis this study addresses, cannot be solved by seeing the problem from one angle of the lens. Looking at the problem from both scientific and constructivist approach could be more revealing.

Sustainability issue is a complex and hydra-headed problem because it has economic, ecological, socio-cultural and political dimensions which are in one way or the other linked. For example, the attempt to use resources to satisfy the economic needs of people create ecological problem and the implementation of sustainability policies requires political will. Even within ecological problem, there exist several issues such as climate change, environmental pollution, deforestation and desertification, depletion of soil fertility, and so on. Looking at these different dimensions of sustainability from either the qualitative or quantitative approach may not provide the multiple points of view required for this investigation. Thus, this study requires the use of multiple research methods that could allow learners to explain how they are transformed towards sustainable living under global education (Ritchie and Lewis, 2003). Hence, the choice of mixed methods for this study was considered proper.

In social science, philosophical debates have their roots in contrasting views of the nature of social reality, and of how knowledge of that reality can be obtained (Alvesson and Skoldberg, 2000; Blaikie, 1993 cited in Kim, 2004). The two areas where people differ in

research philosophy, "relate to the development of knowledge and the nature of that knowledge" (Saunders, Philip, and Thornhill, 2009, p.107). Johnson, Anthony and Onwuegbuzie (2004) explained that for more than a century, the advocates of quantitative and qualitative research paradigms have engaged in unrelenting dispute (paradigm war) as to which paradigm, quantitative or qualitative research paradigm is appropriate for conducting valid research. From this debate, purists have emerged from both sides. On one side of the argument are those who articulate assumptions that are consistent with what is commonly called a positivist philosophy (Johnson, Anthony and Onwuegbuzie, 2004). This school of thought consists of the quantitative purists who believe that social observations should be treated as entities in much the same way that physical scientists treat physical phenomena.

The quantitative purists also contend that the observer is separate from the entities that are the object of observation. They maintain that social science inquiry should be objective. That is, time and context-free generalisations (Nagel, 1986) are desirable and possible, and real causes of social scientific outcomes can be determined reliably and validly. According to the positivist school of thought, educational researchers should eliminate their biases, remain emotionally detached and uninvolved with the objects of study, and test or empirically justify their stated hypotheses (Johnson, Anthony and Onwuegbuzie, 2004). This belief of the positivists stem from their worldview that reality is something out there to be discovered, and this can best be done through objective approach. Positivism as an epistemological position advocates among other things, the application of the methods of natural sciences to the study of social reality; that only phenomenon and knowledge confirmed by the senses can genuinely be accepted as knowledge; that knowledge is arrived at through the gathering of facts that provide the basis for making laws.

On the other side of the debate is the qualitative purists (also called constructivists and interpretivists) who reject positivism and argue for the superiority of constructivism, idealism, relativism, humanism, hermeneutics, and, sometimes, postmodernism (Guba and Lincoln, 1989; Lincoln and Guba, 2000; Schwandt, 2000; Smith, 1983, 1984 cited in Johnson and Onwuegbuzie, 2004). These purists contend that multiple-constructed realities abound, that time and context-free generalisations are neither desirable nor possible, that research is value-bound, that it is impossible to differentiate fully causes and effects, that

logic flows from specific to general (e.g., explanations are generated inductively from the data), and that knower and known cannot be separated because the subjective knower is the only source of reality (Guba, 1990). The interpretive researcher's ontological assumption is that social reality is locally and specifically constructed (Guba and Lincoln, 1994) "by humans through their action and interaction" (Orlikowski and Baroudi, 1991, p.14). Neuman (1996, p.69) affirmed that "social reality is based on people's definition of it". Thus, for the interpretivist, meaning making is based on subjective approach. Interpretivism gives us the opportunity to grasp the subjective meaning of social action by making interpretation of the social action rather than bordering ourselves with the external forces that have no meaning for those involved in that social action (Bryman and Bell, 2007). Qualitative purists are also characterised by a dislike of a detached and passive style of writing, preferring, instead, detailed, rich, and thick (empathic) description, written directly and somewhat informally (Johnson, Anthony and Onwuegbuzie, 2004). Thus, qualitative purists engage in interpretation of views and finding meanings to the views expressed by the research participants.

Both sets of purists view their paradigms as the ideal for research, and, implicitly if not explicitly, they advocate the *incompatibility thesis* (Howe, 1988), which posits that qualitative and quantitative research paradigms, including their associated methods, cannot and should not be mixed. So, a disturbing feature of the paradigm wars has been the relentless focus on the differences between the two approaches. Indeed, the two dominant research paradigms have resulted in two research cultures, "one professing the superiority of 'deep, rich observational data' and the other the virtues of 'hard, generalizable' . . . data" (Sieber, 1973, p. 1335).

However, there are those who believe that there is something good in both the qualitative and quantitative paradigm. This third school of thought advocates for combining the two paradigms in one study. They believe that both the quantitative and the qualitative methods could be combined in one study. The attempt to accommodate these different perceptions of reality resulted in the third research philosophy which has come to be known as pragmatism. Pragmatism has emerged as a common alternative to either/or choice of positivism and constructivism (Creswell and Plano Clark, 2007).

The advocates of pragmatism argue that by focusing on solving practical problems, the debate about the existence of objective ''truth,'' or the value of subjective perceptions, can be usefully sidestepped. As such, pragmatists have no problem with asserting both that there is a single ''real world'' and that all individuals have their own unique interpretations of that world (Morgan, 2007). The mixed methods approach is perhaps of most interest to the 'postparadigm' generation of scholars because it can produce more robust measures of association while explicitly valuing the depth of the ''experiences, perspectives, and histories'' (Ritchie and Lewis, 2003, p. 3) of research participants. When two methods are combined in one study, neither the deductive nor the inductive approach is neglected. Both receive the attention of the researcher, thus giving rise to abduction.

The essence of abduction is to through an innovative combination of existing knowledge, generate possible research solutions and at the same time attempt to integrate various theories and approaches (Tomiyamal, Takeda, Yoshioka, & Shimomura, 2003 cited in Wheeldon, 2010). In this way, abductive reasoning allows for tentative explanations and hypotheses to emerge through the research process based on the expertise, experience, and intuition of researchers (Schurz, 2002). Through this iterative approach, these tentative explanations can be tested both theoretically and empirically (Wheeldon, 201). As Morgan (2007) suggested, by moving back and forth between induction and deduction, one can convert observations into theories and then assess those theories through action. In this study, the inductive results from the qualitative method served as inputs to the deductive goals of quantitative approach, and vice versa, enabling the researcher to also work back and forth between the kinds of knowledge that was produced under the separate banners of qualitative and quantitative approaches (Morgan, 2007). In this way, the study benefited from understanding based on shared meaning (Wheeldon, 2010, p.88) as illustrated in Table 4.1:

**Table 4.1.:** A Pragmatic Alternative to the Key Issues in Social Science Research Methodology (**Source:** Morgan, 2007, p. 71).

|  | Quantitative Approach | Qualitative Approach | Pragmatic Approach |
| --- | --- | --- | --- |
| Connection of Theory and Data | Deductive | Inductive | Abductive |
| Relationship to Research Process | Objective | Subjective | Intersubjectivity |
| Inference from data | Generality | Context | Transferability |

Creswell and Plano Clark (2007, p.26) stated that pragmatism "draws on many ideas including employing 'what works', using diverse approaches, and valuing both objective and subjective knowledge". The philosophy has recently been linked by Tashakkori and Teddlie, 2003 cited in Creswell and Plano Clark, 2007) to mixed methodology research.

Although pragmatism has a clear foundation in empiricism, it goes beyond a pure orientation to observation of a given reality (Goldkuhl (2004). The author argued that the basis in human action gives pragmatism an orientation towards a prospective, not yet realised world. Goldkuhl (2004) stated that pragmatism has an interest not only for what 'is', but also for what 'might be'. So, pragmatism has interest in action; the way to change existence. Underscoring the relevance of this statement, Goldkuhl (2004, p.1) said:

> "To perform changes in desired ways, action must be guided by purpose and knowledge. The world is thus changed through reason and action and there is an inseparable link between human knowing and human action. Pragmatism can be understood as a philosophy that fully acknowledges this mutual permeation of knowledge and action".

For the purpose of this study, the combination of both quantitative and qualitative approach was considered important and useful. Moreover, any ontological position a researcher subscribes to is a matter of choice. This study identified with the pragmatic philosophy which recognises mixed methods as one of the approaches for doing research. Therefore, this study is framed within the philosophy of pragmatism.

Pragmatism provides a researcher the latitude to think freely, moving from one form of reasoning to the other and back as and when necessary. Since the mixed methods approach combines deductive and inductive thinking, as the researcher mixes both qualitative and quantitative data (Creswell and Plano Clark, 2007), it gave the researcher the opportunity to reason both inductively and deductively. Thus, instead of relying on deductive reasoning and general premises to arrive at specific conclusions, or inductive approaches that seek general conclusions based on specific premises, pragmatism (mixed methods) provided the researcher opportunity for a more flexible abductive approach (Wheeldon, 2010). Flexibility removes the rigid attachment to a particular research method which in an attempt to remain loyal to the method could deprive the researcher of very rich information needed to address the research questions.

In addition, finding answers to the research questions rests more on proper understanding of the research problem. The researcher considered the mixed methods research design as appropriate for getting at this better understanding. This decision is in line with the views of Miller and Cameron (2011, p.389) that the central premise of mixed methods is that "the use of quantitative and qualitative approaches in combination provides a better understanding of research problems than either approach alone". Related to this is the view of Cresswell and Plano Clark (2007) that the central premise of the mixed methods is that when quantitative and qualitative methods are combined in one study, it provides a better understanding of research problems than either approach used alone.

Furthermore, pragmatism as an approach to doing a study could expand the scope of understanding of the phenomena (McWilliam and Gray, 2008, p. 172) under consideration. The expansion in the scope of understanding is envisaged from the greater depth of knowledge the mixed methods provide, especially through the use of the quantitative approach. To get to the depth of knowledge of the phenomena under study, the researcher adopted the explanatory research design which allowed the researcher to use qualitative data to explain quantitative significant (or non-significant) results, positive-performing exemplars, outlier results, or unexpected results (Morse, 1991).

## 4.3 Rationale for Mixed Methods

This study is an exploratory research. It is exploratory because the studies that have been done in this area showed that only few related studies have been carried out on the transformation that takes place in the behaviour pattern of learners with regard to sustainable living (Akel, 2006; Beringer, 2007; Carew and Mitchell 2002 as cited in Kagawa, 2007) especially under global education field (e.g. Selby, 1999; 2004). Therefore, the problem has not been well defined. This reason underscores why this study is exploratory in nature. To find out whether there is transformation going on, with respect to producing students with sustainable behaviours and attitudes, a deeper level of inquiry using the mixed methods research was considered important. This method of research has been rarely employed in related studies and this further contributes to the exploratory nature of this study.

The use of mixed methods research for this study enabled the collection of both quantitative and qualitative data. The collection of both set of data was considered central for getting the information needed to investigate the transformation of students towards sustainable living. Responses of the research participants to the survey questions showed their specific behaviours and actions towards the environment. Equally, the stories told by the participants during the qualitative interview revealed more information about the impacts of global education on the transformation of learners towards sustainable living. Thus, the mixed methods approach helped the researcher to investigate in real terms the behaviours and actions of the participants in creating a sustainable environment.

Also, in a study which the relationships between phenomena being studied were considered as complex, an in-depth exploration of the relationships was required. Such in-depth exploration required research method that could explore the depth of the phenomena. The depth of any phenomenon can best be investigated through qualitative discussion. This type of discussion allowed the research participants to provide details of their experiences without being bracketed off by any form of structured questions. The qualitative approach aspect of this study permitted exhaustive discussion between the researcher and the research participants on the issue that was investigated. Therefore, the use of mixed methods for this study provided the opportunity for each method to discover information at different levels of

social reality (Mason, 1996). For example, in this study, the quantitative data provided breadth because of the large number of respondents to the questionnaire and qualitative data provided depth (Mason, 1996) because of the detailed information obtained from the interviews. In essence, the data and methodological triangulations employed in this study helped the researcher to generate what anthropologists call "holistic work" or "thick description" and to capture a more complete, holistic, and contextual portrayal of the unit(s) under study (Jick, 2009).

The relationship between transformation of learners and sustainability is considered as complex because human beings are not robot. Their behaviours are therefore dynamic and not static. Therefore, getting a consistent account of the transformation of learners towards sustainable living is not a straight forward issue. To deal with this complex issue, the researcher employed the mixed methods research. In this regard, the quantitative phase was used to get specific information about the transformation of students towards sustainable living under global education field. This method was followed by a more in-depth qualitative interview to seek for corroboration, consistency, and details about the phenomena. Thus, this approach provided the researcher with the opportunity to triangulate the data from gathered from both quantitative and qualitative techniques. The data that resulted from each of the method was triangulated to find out areas of agreement, and or contradiction. However, triangulation revealed contradiction, some inconsistency, and convergence but as Denzin (1978) said, any of these outcomes that prevail, the researcher can construct superior explanations of the observed social phenomena. Triangulation was defined by Denzin (1978, p.291) as "the combination of methodologies in a study of the same phenomenon".

Also, the mixed methods research as used in this study helped the researcher to reduce the weaknesses inherent in either the quantitative or the qualitative method when used separately. Therefore, in the conception of mixed methods for this research, the goal was not to replace either the quantitative or qualitative approach as both have been recognised in this study as important but rather, the use of both methods simultaneously was to draw from the strengths of both and minimize the weaknesses of each when used alone in a study (Johnson and Onwuegbuzie, 2004). For example, the face-to-face interview provided by the qualitative approach helped the researcher to ask follow up questions when necessary, read non-verbal

cues, and share views with the research participants on their experiences with regard to the transformative powers of global education.

Furthermore, every research method has its own bias. Such bias can affect the research findings in a negative way. Since all research methods have inherent biases and limitations which make the use of one method to assess a given phenomenon yield biased and limited results, the researcher used the qualitative and quantitative methods together in this study to seek for convergence, corroboration and correspondence as ways of enhancing the validity of inquiry findings (Greene, Caracelli, and Graham, 1989). Although it may not be possible to completely cancel out the biases inherent in research methods by using mixed methods, methodological pluralism helped to reduce such inherent biases. For example, the use of survey questionnaire for quantitative data collection helped the researcher to minimize the effects of the researcher's own bias experienced in the use of qualitative approach.

Again, the complementary role each set of data provided for each other and the triangulation of quantitative and qualitative data provided significant support for the inadequacy of either of the data. Quantitative and qualitative data in this study complemented each other in such a way that where one set of data was inadequate, the second set of data made up its inadequacies and biases. In support, Denzin (1978) stated that the use of mixed methods makes it possible to cancel out the bias inherent in any particular data source, investigators, and particular method when one method is used together with other data sources, investigators, and methods; and the result obtained can be relied more on as the truth about some social phenomenon. In other words, since the qualitative and the quantitative methods are not the same, the complementary role provided collaboration that was seen as a way of using the advantages and minimizing the disadvantages of any one particular approach (Arnon and Reichel, 2009; Brannen, 2005; Johnson, Onwuegbuzie, and Turner, 2007; Creswell and Plano Clark, 2007).

Equally, because the nature of information sought for in this study had to do with human behaviours, especially with respect to how to live sustainably, the quantitative and qualitative data obtained enabled verification of the authenticity of respondents' claims. Corroboration in

the results was considered as a proof of validity. In support of this reason for using the mixed method research, Sechrest and Sidana (1995) argued that complementary data may be used for verification purposes and is also used in order to provide some basis for estimating the possible error in the measure of central interest.

Also, the method(s) used in doing a particular study is not the central issue in any research but how the method(s) is applied to arrive at valid research findings. Therefore, it is not necessarily sticking to the traditional methods of doing research that gives a study its credibility and, or determine the validity and reliability of the results obtained. What matters more is using the methods that appeals to the researcher for solving practical problems. The choice of the mixed methods research for this study was based on the researchers understanding that no one method is a panacea to arriving at social truth (Guber and Lincoln, 2005). Therefore, a researcher is at liberty to use any method(s) considered appropriate for investigating a particular problem. In this study, the mixed methods approach was applied to get to the root of the problem.

In addition, every research participant has his/her personal view of reality. There are several ways individuals can express their views on any particular social problem. For this reason, participants in this study were offered the opportunity to express their views either qualitatively or quantitatively or both. To give the research participants this opportunity, the researcher distributed structured questionnaire which they responded to. On the other hand, the face-to-face interview provided additional opportunity for participants in this study to either consolidate their view points or come up with alternative views.

Furthermore, the nature of the population involved in this study made it necessary to use mixed methods approach. The population of study is a heterogeneous mix of students (Girod, Twyman, and Wojcikiewicz, 2010) from Africa, Asia and Europe. Perhaps, the ways people from different cultures see issues of sustainability and what is considered as transformation in different cultures differ. To allow for an opportunity for individuals from different cultural background to express their worldview on global issues, the mixed methods research that could accommodate either quantitative and, or qualitative worldview was used for this study.

On the whole, because the researcher considered one form of data as insufficient by itself for this study, and that neither qualitative nor quantitative methods were sufficient by themselves to capture the trend and details of the situation (Ivankova, 2007; Ivankova, Cresswell and Stick, 2006), this study was therefore framed within triangulation mixed methods design to take advantage of the two research approaches. This design enabled the researcher to bring together the strengths of both quantitative and qualitative research, compare results, validate, confirm, or corroborate quantitative results with qualitative findings (Creswell and Plano Clark, 2007).

## 4.4 Research Design

The mixed methods sequential explanatory design within triangulation method was used for this study. This design consists of two distinct phases: the first phase is quantitative followed by qualitative (Creswell and Plano Clark, 2007). The process the researcher followed was to first collect the quantitative data, analyse them and find trends which helped inform the collection of data from the second phase of interview which was based on the collection of qualitative data. The qualitative data were analysed after the collection and the results from both the quantitative and qualitative data were combined at different states of the data presentation, analysis and discussion of findings.  In support of this procedure, Ivankova, Creswell and Stick (2006) explained that in this design, the first thing the researcher does is to collect and analyse the quantitative data before collecting and analysing the qualitative data; the second phase builds on the first phase and both phases are connected in the intermediate stage in the study. The reason for this approach is that the quantitative data and the results obtained from the analysis provides a general understanding of the research problem while the qualitative data and the results from the analysis refine and explain those statistical results by exploring participants' views in more depth (Rossman and Wilson 1985; Tashakkori and Teddlie 1998; Creswell, 2003 cited in Ivankova, Creswell and Stick, 2006)

Ivankova, Creswell and Stick (2006) argued that mixed methods sequential explanatory design has the advantage of straightforwardness and opportunities for the exploration of the quantitative results in more detail.  They however, noted that the limitations of this design include the problem of the long time it takes and feasibility of resources to collect and analyse both types of data. But these limitations were not insurmountable. The researcher was

able to handle the limitations in such a way that they did not significantly affect the validity and the reliability of the result obtained. For example, the long-time it could take to collect the two sets of data was reduced by using a population sample that was easily accessible. To collect the quantitative data, the researcher served the questionnaires to students at the time they were available at the university library. To reduce the time for collecting quantitative data, the questionnaire was made clear, simple and straight forward. And because the questions were clear, simple and straight forward, respondents were able to answer the 20 questions in five minutes.

In addition, because the researcher administered the questionnaire in the part of the university library were students are allowed to come together, have some rest, and engage in discussions, he was able to administer many questionnaires at the same time. This made it possible for many students to address the questionnaires within the same time frame, thus returning as many questionnaires as possible to the researcher at the collection point. Those who did not have the time to respond immediately to the questionnaire were contacted on phone at later time by the researcher to collect the answered questionnaires. All together, the approach ensured high response rate.

Before choosing the sequential explanatory research design for this study, the researcher read through different types of mixed methods research design. For example, convergent design which allows for concurrent collection of quantitative and qualitative data and analysing each data set separately before merging the two sets (Cresswell and Plano Clark, 2011). Others mixed methods designs the researcher read through were exploratory design, embedded design, transformative design and multiphase design (Cresswell and Plano Clark, 2011). Many of these designs, especially the transformative design appealed to the researcher. The transformative research design was particularly appealing because the research topic was about transformation and transformative design is suitable for studies that seek to address social injustice which was partly the interest area of the researcher. However, this design was not used because it uses a theoretical-based framework like transformative worldview which seeks to advance the needs of underrepresented or marginalised population (Cresswell and Plano Clark, 2011). Because this study did not focus on the needs of an underrepresented population, it could not use a research design that is limited to the study of underrepresented people. Sustainability crisis affects both the represented and underrepresented. It is a universal problem which calls for using research design that does not discriminate against

social class to investigate it. Hence, the sequential explanatory mixed methods research design was considered most suitable.

The explanatory sequential mixed methods research design provided the researcher the opportunity to take care of some unexpected findings by locating such findings in one of the approaches that gave rise to it. Hanson *et al.,* (2005) noted that these designs are particularly useful because they help in explaining the relationship and/ or the findings of the study. However, any other methods could have as well helped the researcher to explain study findings but the explanatory design made the researcher to have confidence in the results obtained from the study.  The methodological and data triangulations the design allowed gave the researcher a stronger base to claim that the explanations offered for the research findings were authentic and valid.

The sequential explanatory research design has been successfully employed in various studies. Some of these studies used the mixed methods approach and employed this research design to explain the research findings and/ or relationships. For example, in a study on *Parents as agents of career development,* Palmer and Cochran (1988, p.71) employed this sequential mixed methods explanatory design to provide "an empirical test of parent effectiveness in a structured career development programme for their children".

## 4.5 Methodological Design

The methodological design for this study was divided into two, the quantitative survey design and the qualitative design. Each of the design was treated on its own merits but later integrated at the level of discussion of results. This design method was supported by Greene, Caracelli and Graham (1989) when they stated that analyses could be conducted separately, but in this case, some integration would be made during interpretation. This implied that the advantages of using quantitative approach were utilised during the stage of data collection, interpretation and analysis. For example, the use of survey research enabled the testing of research hypothesis. To test the hypotheses, a t-test and correlation analysis using SPSS were carried out. Correlation (R) as pointed out by Okeke (1995 cited in Nwodu 2006, p.184) is "an indication of the degree of association between two variables, or more accurately, the amount of reduction in error in predicting values of one variable from values of the other". Put succinctly, correlation coefficient (r) or Parson's (r) measures the extent to which two

variables are related or associated to each other (Nwodu, 2006). This type of test and analysis would not have been possible if only a qualitative approach was used.

The researcher investigated the hypotheses by administering questionnaire to a representative population sample. Before the administration of questionnaire to the sample population, the researcher first administered a pre-test questionnaire assessing the baseline attitudes and knowledge about sustainability issues - climate change and global warming, environmental pollution, and degradation, deforestation and desertification (Erick *et al.,* 2013), and other ecological issues and their implications on the survival of our planet and society. To measure the degree of transformation experienced by the students, participants' attitudes served as the dependent variable.

The second phase of data collection through qualitative interview of fewer number of respondents provided the depth of information that was absent in the survey approach. In this qualitative approach, the researcher interviewed 10 students from different countries and cultural backgrounds. The sample of 10 students interviewed using this method was drawn from the research participants that took part in the survey. This approach was used to give the research participants the opportunity to explain their transformative experiences under Global education in more details, an explanation that was not permitted by the questionnaire instrument used in the survey method.

Furthermore, the approach also afforded the researcher the opportunity to give a fairly equal representation to students from the Africa, Asia, and Europe who formed the bulk of the sample population. This fair representation was done by selecting 4 participants from Africa, 3 from Asia and 3 from Europe. Achieving this type of representation was not possible with the quantitative approach. This was because there were many participants who were administered the questionnaire. So, what was more important was ensuring that each participant belonged to one of the races of research interest. The inclusion of students from Europe in the sample population was to provide a standard for measuring the level of transformation that students from African and Asian countries experienced under global education. It would have been difficult to quantify the experience of international students

141

with regard to transformation without an idea of how students from the host countries also experience transformation. To also see whether the experience of transformation was peculiar to students in the university or not, 3 students from college and one level 3 students were as well interviewed. Below is the model of sequential explanatory mixed methods design procedures used for the data collection and analysis:

| Phase | Procedures | Products |
|---|---|---|
| Quantitative Data | Administration of questionnaires; Survey (n = 400) | Descriptive statistics |
| Quantitative Data Analysis | i. Data screening (Univariate & ii. Multivariate outliers) SPSS Quantitative Software v.20 | Cases (n – 1) |
| Connecting Quantitative and Qualitative phases | i. Purposively selected participants. ii. Developing interview questions. | Interview protocol |
| Qualitative Data Collection | Individual in-depth face-to-face interview | Text data (interviews and transcripts) |
| Qualitative Data Analysis | Coding and thematic analysis | i. Codes and themes ii. Similar themes |
| Integration of Quantitative and Qualitative Data | Interpretation & explanation of quantitative and qualitative results | i. Discussion ii. Implications iii. Further research and conclusions |

**Figure 4.1:** Model of sequential explanatory mixed methods design

**Source:** Adapted from Ivankova, Creswell and Stick, 2006, p.16

As shown in the research model above, there are three columns: phase, procedures and products. Each column is connected to the others. The entire model showed that they were two approaches to the research. These were the qualitative and quantitative approaches. The data collection process started with the collection of quantitative data. Statistics obtained using this method was purely descriptive. Data analysis in this phase followed immediately after data collection. However, before the analysis, collected data were screened to identify Univariate and multivariate outliers.

## 4.6 Priority, Implementation and Integration

**(a) Priority:** In this study, the researcher placed greater attention to qualitative data. The reason for taking this decision was because the study required an in-depth investigation of the phenomena. To get the required detailed information, the researcher carefully articulated 20 qualitative questions asked in such a way that they elicited detailed responses. Many of the questions asked in the interview guide generated follow up questions during the actual interview. The follow up questions probed further into the interview topic and helped to clarify areas that the key questions in the interview guide did not take care of. The detailed information that emerged from the qualitative interview was used to support the data from the quantitative approach. This resulted in tick description that revealed the degree of transformation towards sustainable living experienced by learners under global education system.

On the other hand, the quantitative data was used to gather more specific information on the areas learners have experienced transformation. Although the quantitative data did not provide in-depth information as the qualitative interview, it provided breadth that made the data collected more representative. Also, because the quantitative data was collected first, it provided the researcher with information in the areas that required more exploration. These areas revealed by the quantitative data were further explored during the qualitative interview. Questions asked in the qualitative interview were therefore based on the outcome of the quantitative survey. However, the fact that priority was placed on the qualitative approach did not mean that the quantitative survey was not significant. Both the quantitative and

qualitative methods played complementary role that helped in making the research approach more robust.

**(b) Implementation:** Implementation of the methodological design was sequential. The data were collected over a period of time in two separate phases. The researcher first collected the quantitative data and analysed before collecting and analysing the qualitative data.

### i Procedure for Collection of Quantitative Data

Plans for collection of quantitative data started with the articulation of the questions that was asked respondents. The questions the researcher articulated were discussed with the first supervisor and corrections made. These questions were then tested with some colleagues. It was discovered that some of the questions were not clearly understood by the participants. The researcher therefore went back to the drawing board and restructured the questions. The amended version was again discussed with the supervisor before going to the field. In the field, the researcher met with the participants face-to-face. On meeting with any participant, the researcher introduced himself and requested to discuss the research topic with the participant. Those who agreed to this request were given participant information sheet and consent form to read and sign before any further discussions. This was in keeping with the ethics regulation of the Anglia Ruskin University.

After the prospective research participant had read and signed the necessary documents, he/she was given a copy of the questionnaire to respond. Those who had the time to respond to the questions on the spot did and the researcher collected them back. I cannot forget my conversation with one of the students after he had completed the questionnaire and handed in to me. In brief, he asked: *Why are you talking about doing business in a manner that will place less emphasis on making profits and caring more about the environment when you are a business school student?* He went on: *Is business not all about making profits?* The discussion that followed was interesting as I tried to explain why the research was important.

The feelings of the students that took part in the study were pleasant. They were happy to be part of the research and many of them who expressed their opinion stated that the research topic was an important one that came at the time it was mostly needed. The researcher

thanked each and every participant who completed the questionnaire. However, some people the researcher approached said they were too busy to take part in the study. The researcher still thanked such individuals and wished them well in their studies. It was generally a very conducive atmosphere and an interesting experience for the researcher.

**ii Procedure for Collection of Qualitative Data**

This section discussed general issues of interviewing together with the practicalities of my fieldwork, particularly in organising and carrying out interviews. For the purpose of collecting qualitative data, individual based interview otherwise called personal interview was used. This is a one-on-one interview where the researcher met and interviewed each person on the subject of research. The interviews took place on pre-agreed date, place and time. Denham (2009) said this type of interview last between 30 to 90 minutes. However, in the interview for this study, there were some of the interviews that lasted for more than 90 minutes. The reason for this longer duration was discovered to be based on cultural backgrounds of research participants. For example, participants from Africa and India spoke for longer duration than participants from Europe.

The collection of the qualitative data in the second phase of the study was related to the outcome of the first quantitative phase (Ivankova, Creswell and Stick, 2006). The decision to follow the quantitative-qualitative data collection and analysis sequence in this design was arrived at from the study purpose and the research questions which required the contextual field-based explanation of the statistical results (Ivankova, Creswell and Stick, 2006). It was also important that the quantitative data be collected and analysed first to see trends that could help in the development of the second phase of data collection. Prior to interviewing, preparation was done in terms of developing sets of questions and themes to follow. Effort was made to be as clear as possible in the questioning technique in order to avoid leading questions. This approach helped the researcher to collect data that were fairly objective and free from the bias of the researcher. However, because the researcher did not see himself as completely detached from the study, he sometimes injected into the conversation some ideas that enhanced further discussions on the research problem.

There were general guidelines the researcher established for interviewing. For example, before the interview, the researcher introduced himself and explained the interview purpose to the participants. The researcher found out whether it was convenient for the individual to

grant an interview. He also assured every participant of the confidentiality of the information supplied. Permission to carry on with the interview was sought both verbally and through the reading of participant information sheet and signing of consent form by the participants. To conduct any interview, the researcher requested permission to take notes while assuring the interviewees that any identifiable personal details would remain anonymous and confidential. During interviews, the researcher had two recorders, one was digital and one was analogue, then a notepad, a pen and an interview guide. The researcher started the interview with a general open question (Sambala, 2014). For example, the researcher asked participants whether they were aware of sustainability issues like pollution, climate change, and depletion of resources, unethical dumping and disposal of wastes.

Considering the complexity of the interview topic, the researcher decided earlier not to adhere rigidly to the list of scripted questions. Rather, I used the guide to ensure that the conversation with the respondents covered all the topics of my research inquiry. The interview guide in appendix 4 served only as a guide and did not suggest that the researcher asked all the questions in a single sitting. However, many questions in the guide allowed flexibility, choice and guided what was asked. This approach to interviewing helped to reduce the negative impacts administering questions systematically as a routine would have had on the interview process. For instance, it could be impersonal and intimidating on the part of the respondent. This approach allowed respondents to say what was important and express it in their own words.

Before any interview took place, the researcher notified the interviewee in advance. This helped to make clear the date, time and venue for the interview. The date, time and venue were usually at the convenience of the research participants. This helped to make the interviewing a democratic process. So, every interview took place at an agreed location, time and date. The locations of the interview were found convenient and guaranteed confidentiality.

(c) **Integration:** Integration or mixing of the quantitative and qualitative methods occurred from the beginning of the study during the process of formulating the purpose of the study and introducing both quantitative and qualitative research questions (Teddlie and Tashakkori, 2003). Integration of the two methods also occurred at the time of selecting the research participants. At this stage, the researcher considered two sets of research participants: those

that were served with structured questionnaires for the generation of quantitative data and those that were interviewed for the generation of qualitative data. Later, some of the respondents to the questionnaire were as well interviewed at the qualitative stage of data collection. This approach insured integration of the two research approaches. This approach falls in line with the sequential design, where a researcher typically connects the two phases at the time of selecting the participants for the qualitative follow-up analysis based on the quantitative results from the first phase (Creswell, Plano Clark, Gutmann and Hanson, 2003).

Further integration occurred at the stage of the research design. That is, in the overall structure of the study, a mixture of quantitative and qualitative elements were considered and integrated into the design. Again, the quantitative and qualitative findings were integrated at the interpretation stage of the study (Onwuegbuzie and Teddlie, 2003). This was done by interpreting the responses of participants to each of the structured questionnaire followed by the interpretation of any theme that co-related with such responses in the qualitative interview. By putting the views expressed by participants from both the quantitative and qualitative approach together, it was easy to find out areas of agreements between the results obtained from both approach. This two levels integration approach agreed with the explanations of Hanson *et al* (2005, p.229) that in the mixed-methods sequential designs, "data analysis is usually connected, and integration usually occurs at the data interpretation stage and in the discussion stage". Also, the integration of the quantitative and qualitative methods at different stages of the study helped the researcher to sustain the holistic approach to the study. This holism agreed with the systems thinking that underpinned this study. Furthermore, the connection that occurred at the intermediate stage is in line with the explanation offered by Ivankova, Creswell and Stick (2006) that in the mixed-methods sequential design, data connect in the intermediate stage when the results of the data analysis in the first phase of the study inform or guide the data collection in the second phase.

## 4.7 Measurement Indicators for this Study

According to Bell and Morse (2004, pp. 2-3), "indicators are devices with deeply embedded social, political and moral issues that have implications far beyond the basic logic of any specific methodology or the presentational function of any given statistic". This implies that the choice of measurement indicators does not necessarily depend on the methodological approach to any study. However, in order to get an idea of the level of transformation towards

sustainable living which students at university experience during their course of study, some tested sustainability and transformative indicators were used in this study.

To measure the change in attitudes and behaviours of students with respect to their actions towards the environment, a five item scale Likert questionnaire was used in descending order. The numerical values assigned to the items range from 5 to 1 for strongly agree to strongly disagree respectively. In this scaling, a high scale score means positive attitude:

5 = strongly agree

4 = agree

3 = undecided

2 = disagree

1 = strongly disagree

These indicators were used because they helped to "… capture the essential characteristics of the system and showed a scientifically verifiable trajectory towards those goals or reduction in damaging factors threatening the systems sustainability" (Moldan and Dahl, 2007, p.3)

For the purpose of this measurement, attitude in this study was regarded as "a state of readiness, a tendency to respond in a certain manner when confronted with a certain stimuli" (Oppenheim, 2006, p.174). The stimuli in this regard are the type of education, or teaching and learning students receive under global education. Basically, two methods of attitudes measurement have been rated the best: the "method of equal appearing intervals" developed by Thurstone and Chave and the "method of summated rating" developed by Likert. The Likert method was developed after Thurstone and Chave attitude scale method and is said to be a simpler method for measuring change in attitude than the former (Oppenheim, 2006).

The choice of Likert attitude scale as the  measuring scale in this study was based on the fact that attitude vary quantitatively and respondents can respond to the scale to reflect their change of attitude from strongly agree to strongly disagree on the 5 scale items. Supporting

the use of the Likert scale for the measurement of quantitative values in this study, Lo and Ogden (2012) stated that much of the quantitative research within social sciences relies on the use of numerical scales and in the main Likert scales have emerged as dominant measurement.

On the other hand, because this study employed the mixed method research, other variables associated with attitude change such as knowledge gained from learning and which cannot be perfectly measured quantitatively was explored using qualitative interview.

## 4.8 Quantitative Data Analysis

The analysis of quantitative data from the Likert scale was done using correlation to find out the relationships between global education and transformation of learners towards sustainable living. This method of data analysis was successfully used in a study by Lo and Ogden (2012) which employed the Likert scales to show how meaningful the Likert scales are in the evaluation of how ratings are made and the role of response shifts in the socially disadvantaged.

## 4.9 Sample Size

The sample size was determined from a population of students at Anglia Ruskin University. Anglia Ruskin University was awarded university status in 1992 and has since then grown to become one of the largest and most highly regarded universities in East of England, with a current population of around 31, 000 (Anglia Ruskin University, 2014 Report). However, for the determination of the sample size, only 20, 000 out of the 31, 000 total population of the university was considered relevant. This was because this number represented an estimate of the students' population of the selected campuses of the university.

The sample size for the final administration of questionnaires was 400 students. However, only 370 questionnaires representing 93% was returned. Thus, 30 questionnaires were not returned, and were recorded as casualties. The number returned was considered large enough to provide adequate information needed for testing the hypothesis. It also provided sufficient responses to the questionnaires and thereby gave the researcher enough information upon

which corroboration between the quantitative and qualitative data was sought. In addition, more detailed information was gathered using qualitative interview. This was a face-to-face interview in which the researcher had the opportunity to ask follow up questions. This approach led to more robust measures of association while explicitly valuing the depth of the "experiences, perspectives, and histories'' (Ritchie and Lewis, 2003, p. 3) of the research participants.

To determine the sample size of the population of the study, the researcher applied the Yaro Yamani sample determination formula. The formula according to Akunna (2008) is one of the mathematical approaches of selecting sample size in recent social science studies. It is basically used when and where the population size of the study is known. The essence of using this formula to determine the sample size is to ensure that the sample for the study is proportionate to the population. Using a sample size of 400 to estimate a giving population of 20,000, the researcher worked out the following:

Given that,

$$S = \frac{N}{1 + Ne^2} \quad \text{---> Eqt. 1}$$

*Such that,* **S** = *Sample Size (400)*
**N** = *Population Size (estimated size = 20000)*
**e** = *Error Level (Unknown)*

From (*Eqt. 1*) making **e** subject formula:

$$S(1 + Ne^2) = N$$

$$S + SNe^2 = N$$

$$SNe^2 = N - S$$

Divide both sides by **SN**

$$e^2 = \frac{N - S}{SN}$$

$$e = \sqrt{\frac{N - S}{SN}}$$

Therefore, to determine the error value for a population size of **N = 20,000** and sample size of **S = 400;.**

$$e = \sqrt{\frac{20{,}000 - 400}{400 * 20{,}000}}$$

$$= \sqrt{0.00245}$$

Error value (e)      $= 0.0000060025$ or $0.6 \times 10^{-5}$

Thus, with an error value (e) of $0.6 \times 10^{-5}$ for a population size of N = 20,000; The sample size (s) is calculated by

$$S = \frac{N}{1 + Ne^2}$$

$$S = \frac{20{,}000}{1 + 20{,}000 * 0.0000060025^2}$$

$$= \frac{20{,}000}{1 + 20{,}000 * 0.00245}$$

$$= \frac{20{,}000}{1 + 49}$$

$$= \frac{20{,}000}{50}$$

The value of the sample size (s)    = **400** (*with an error value of 0.6 x 10⁻⁵*)

From the above calculation, the sample size of this study will therefore be 400 respondents. In order to ensure that the sample population represented students who had experienced some level of transformation in the ways they related with the environment with respect to sustainable living, only the students that had spent up to six months at the university were studied. At this stage of learning, students were expected to have begun to develop the ability to engage in reflection, that is, the ability to re-examine their prior experiences in order to learn from it, and perhaps, begin to think in a new way. The minimum age requirement provided for in the questionnaire was 16 years old. Although "the minimum age to study a degree programme at university is normally at least 17 years old by 20 September the course begins" (The UK European University, 2013), but provision is made for exceptional cases that the university may waive this requirements for applicants who will be at least 16, but less than 17 years of age on admission. To accommodate students that fall under this exceptional

circumstance, the researcher used age bracket of 16 years to 24 years and above (The UK European University, 2013).

Furthermore, by the time a student spends six months and above at the university, the student must have been exposed to alternative perspectives and different activities designed to encourage critical self-reflection. Supporting the change to sustainable living that could occur within a  period of six months, Lang (2009) in her discussion of the topic: *Fostering a learning sanctuary for transformation in sustainability education,* described how she designed and used a course to make learners explore a range of sustainability alternatives and at the end of meeting with the learners for sixteen three-hour sessions, once a week over three months, including four sessions as a weekend retreat, participants found the concept of sustainability powerful for re-thinking their working and living and for creating change.  This means that participants were able to experience transformation in their perspectives and ways of living in a period a little above three months.

## 4.10 Sampling Technique

In order to select a sample that is representative of the study population and also includes a cross section of participants from countries that were specifically mentioned in the sample population, the researcher used purposive sampling technique. This sampling technique was considered as the most suitable method for selecting a representative sample. This technique, according to Okeke (2001) affords the investigator the opportunity to include those from whom he can get the requisite data or information. It also ensured that different races targeted as the universe of study were adequately represented. The purposive sampling focused on individuals that met up the desired criteria for this study.  A population sample of 10 participants selected and interviewed during the field work was considered sufficient when at a point during the interviewing process, it was discovered that theoretical data saturation was attained. The sample also produced relevant information on the topic (Darlington and Scott, 2002).

## 4.11 Measured Variables

Four main variables were included in the analysis to capture the impacts of global education on the behaviours of students towards sustainability. The variables were participants' attitudes, intention, commitments, and sustainability. Using these variables, the researcher sought for the relationships between global education and sustainability. Global education was used as independent variable. The use of global education as an independent variable ensured that any observed change in the behaviours and actions of the students towards sustainability issues as measured in this study was the result of transformation enhanced by the global education approach to teaching and learning.

## 4.12 Dependent variables

The dependent variables in the study were attitudes and intentions. The attitudes and intensions of students towards implementation of environmental sustainability actions were measured against global education. Intention was operationally defined as the ideal behaviours that participants would like to engage in, whereas commitment was defined as the extent to which participants actually carried out these behaviours (Sosu, McWilliam and Gray, 2008, p. 172). The essence of considering intention as a variable in the study was because human action is usually preceded by the intention to act. It is intention that translates to action. However, every intention is not likely to translate to action. This notwithstanding, there was still the need to measure intention because intention has strong relationship with transformative learning, formation of attitudes and beliefs (Tello, Swanson, Floyd, and Caldwell, 2013).

## 4.13 Independent variables

The independent variables that predicted intention and commitment were the type of education students received at university and the approach to teaching at university under the global education. The dependent variables in this study were measured against these independent variables by asking the research participants how the education they received and the approaches to teaching influenced them. The kind of influence that was measured was however limited to the changes in the attitudes and behaviours of the learners in relation to sustainability living.

## 4.14 Measurement Instruments

The questionnaires administered to students were used as the instruments to measure the constructs of interest in this study. Kemberlin and Winterstien (2008, p.2281) stated that "With surveys, researchers rely on responses to questions to provide measurements of the constructs of interest". The constructs in the study were theoretical constructs. To measure them, values were assigned to each construct. The questionnaires used as the measurement instrument were designed to ensure construct validity (i.e. the elements/questions were appropriate considering the purpose of the study and the theory from which they were drawn to measure the constructs they were supposed to measure, e.g. intention and commitment to sustainability). Because the data generated with the survey instrument (questionnaire) was triangulated with those generated from qualitative interview, they helped the researcher to achieve convergent validity (i.e. the scores obtained from quantitative survey and qualitative interview converged as a proof that data generated from the mixed methods measured the same constructs). The evaluative questions for the survey measured the transformative potential of education towards sustainable living.

## 4.15 Qualitative Methodology and Analysis

In the qualitative methodology, the researcher used qualitative interview in the collection of data from the research participants. This was done using unstructured interview questions in exploring the transformative experiences of students and their commitments to actions toward sustainability.

### 4.15.1 Qualitative Data Analysis

The researcher used thematic analysis as the means of identifying, analysing and reporting patterns within data and describing the data set in detail (Braun and Clarke, 2006). Thematic analytical method is not attached to any particular method of research. Its theoretical freedom makes it compatible with both the essentialist and constructionist paradigm, thus providing the flexibility which makes it a useful research tool which has the ability to provide a rich and detailed, yet complex account of data (Braun and Clarke, 2006). This approach to data analysis was used by Clark and Kitzinger (2004 as cited in Braun and Clarke, 2006) in Victoria's research on representation of lesbian and gay parents on 26 talk shows to capture something important in relation to the key research question. The use of thematic analysis

enabled the researchers to "capture an important element of the way in which lesbians and gay men 'normalise' their families in talk show debates" (Braun and Clarke, 2006, p.10).

## 4.15.2 Procedure

The researcher read through the data collected by qualitative interview, identifying the themes that were in line with the objectives of the study. The identification of themes helped the researcher to capture things that were important about the data with regard to the research questions (Braun and Clarke, 2006). This was followed by coding of the data according to the identified themes and categories. Each theme captured something important about the data in relation to the research question and represented some level of patterned response or meaning within the data set (Braun and Clarke, 2006). The identification of themes was done manually. The reason for using manual approach to analyse the qualitative data as an alternative to the use of Nvivo was because the sample population was not large enough to warrant the use of Nvivo. Thus, the manual approach was considered appropriate. The detail of the procedure followed in doing the qualitative data analysis was borrowed from the steps (Lihong, 2010; Brennan, 2005; Huberman and Miles, 1994, p.429) identified. These authors identified some key stages into which data analysis could be characterised and Lihong (2010, p.127) specifically listed the steps as follows:

(1) Organising the data into manageable units by using index numbers to code the storytelling data and field into themes;

(2) Identifying patterns in the data by looking for recurring themes and the relationships between them and coding them accordingly;

(3) Developing a classification system of open codes, based on developing typologies and taxonomies from the data;

(4) Putting the main themes that emerged into categories according to the intensity or frequency of the themes on different stages;

(5) Studying the variations and generating new concepts;

(6) Examining negative cases or deviant cases that arise and dealing with them accordingly;

(7) Constantly comparing and contrasting the patterns emerging from the data with existing theories in the literature and explaining how the emerging data relate with the existing theories.

In this study, the type of thematic analysis used was the theoretical thematic analysis. This guided the coding pattern aimed at addressing specific research questions. The inductive approach was not used because the researcher was not interested in addressing research questions that might have emerged from previous studies. Thus, the method of coding followed was driven by the researcher's theoretical or analytical interest in the area, and was therefore more explicitly analyst-driven (Braun and Clarke, 2006). The data was therefore specifically coded to find out the part global education plays in the transformation of learners towards sustainable living.

The themes coded in the data were identified at semantic or explicit level. According to Patton, (1990 as cited in Braun and Clarke, 2006), with a semantic approach, the themes are identified within the explicit or surface meanings of the data and the analyst is not looking for anything more than what a participant has said or what has been written. Essentially, the analytic process involves a progression from description, where the data have simply been organised to indicate patterns in semantic content, and summarised, to interpretation, where there is an attempt to theorise the significance of the patterns and their wider meanings and implications (Patton, 1990 cited in Braun and Clarke, 2006), often in relation to previous literature. These processes have been summarised by Brennan (2005) from the work of Strauss and Corbins 1990, Spiggle, 1994, Miles and Huberman, 1994 cited in Brennan, 2005) as shown in Figure. 4.2):
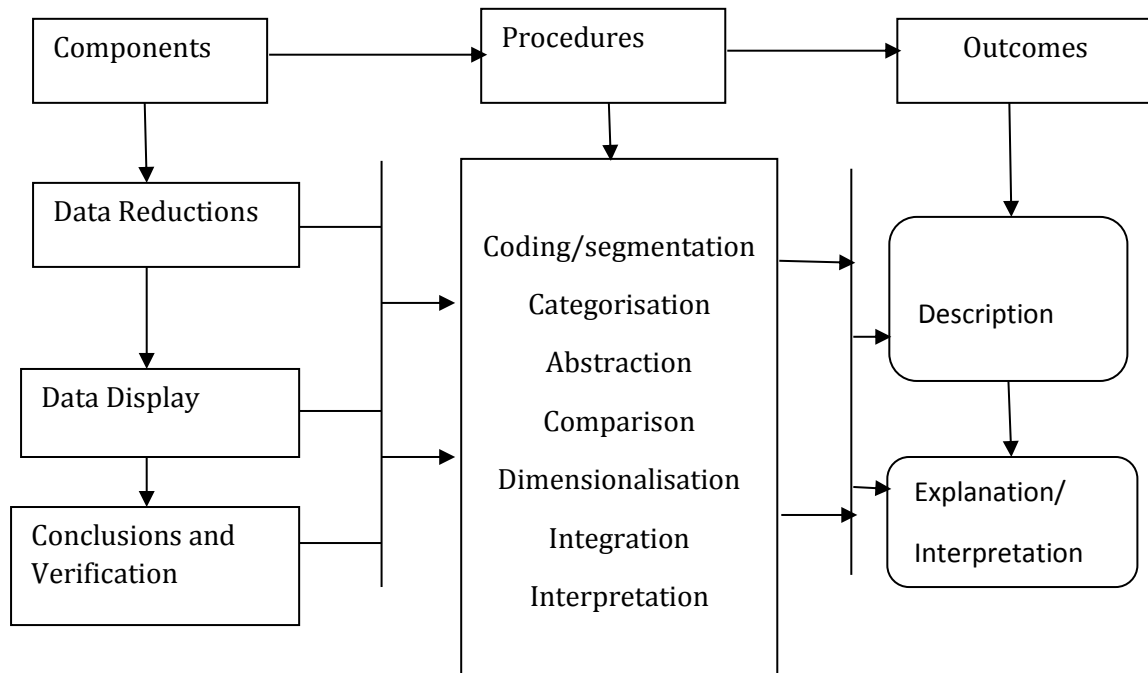
**Figure 4.2:** Qualitative Analytical Processes

**Source:** Adapted from descriptions of Strauss and Corbin, 1990, Spiggles, 1994, Miles and Huberman, 1994 as cited in Brennan, M. 2005.

As shown in Figure. 4.2, the components of the data analysis included data reductions, data display followed by conclusions and verifications. The analysis followed these procedures: coding, categorization, abstraction, comparison, dimensionalisation, integration and interpretation. This procedure resulted in full description and explanation/interpretation of the data. With data reduction, a reasonable data selection and condensation was achieved by way of summaries, coding, finding themes, and writing stories (Huberman and Mill, 1994). Data display defined as "an organised compressed assembly of information that permits conclusion drawing and, or action taking" (Huberman and Mill, 1994, p.429) helped the researcher to get a reduced set of data as the basis for thinking about its meaning (Huberman and Mill, 1994).

Also, segmenting, which means to excerpt meaningful and relevant passages from the data, was conducted concurrently with coding. The researcher then categorised codes to search for possible pattern in the data. The data analysed using this approach was judged to determine their validity and reliability through the use of the criteria of trustworthiness and authenticity. These criteria were adjudged to guarantee a more reliable way of assessing qualitative research that provides an alternative to reliability and validity (Bryman and Bell, 2011).

### 4.15.3 Trustworthiness and Authenticity

Like other qualitative methods, data collected through qualitative interview rely more on criteria other than validity, reliability, and generalizability ((Connelly and Clandinin, 1990, p.7). These criteria are trustworthiness and authenticity. To judge the trustworthiness of the data collected through qualitative method, Guba and Lincoln (1994) stated that such judgement is based on the criteria of credibility, transferability, dependability and confirmability while the authenticity criteria of fairness depends on ontological authenticity, educative authenticity, catalytic authenticity (stimulates to action), and tactical authenticity (empowers action). The parallels of the criteria of *trustworthiness* in qualitative research and the equivalent criteria in quantitative research as stated by (Guba and Lincoln 1994, p.114; Bryman and Bell 2011, p.395) are:

- *Credibility*  parallels internal validity;
- *Transferability* parallels external validity;
- *Dependability*  parallels reliability;
- *confirmability* parallels objectivity;

Credibility in this context refers to the confidence that can be placed in the data generated and in the analysis. It deals with the focus of the research and refers to confidence in how properly data and processes of analysis address the intended objective (Polit and Hungler, 1999 as cited in Graneheim and Lundman, 2004). The researcher ensured credibility of the research findings by making sure that no relevant data was inadvertently or systematically excluded or irrelevant data excluded (Graneheim and Lundman, 2004). This ensured that themes and categories were well covered.

Also, care was taken to enhance transferability of the research findings.  Transferability refers to "the extent to which the findings can be transferred to other settings or groups" (Polit and Hungler, 1999, p.717 as cited in Graneheim and Lundman, 2004, p.110). To facilitate transferability, the researcher selected research participants from different cultural backgrounds, made use of mixed methods in the data collection and analysis, and followed it up with a rich and vigorous presentation of findings, using appropriate quotations from the texts (Graneheim and Lundman, 2004).

With respect to the authenticity criteria, the element of fairness in the authenticity criteria answers the question; does the research fairly represent different viewpoints among members of the social setting? (Bryman and Bell, 2003, p.289). In this study, for example, the data collected represented the views of different genders and students from different cultural backgrounds. The ontological authenticity element addresses the question does the research help members to arrive at a better understanding of their social milieu, while the educative authenticity element answers the question does the research help members to appreciate better the perspectives of other members of their social setting? (Bryman and Bell, 2003, p.289). In this regard, this study presented excerpts of participant's viewpoints indicating the viewpoints of students from different cultural backgrounds.

In order to ensure the trustworthiness of the study, some important steps which were not independent of but built into the rigorous research process were taken. The steps taken to ensure trustworthiness in this study following Lihong (2010, p.129-139) guidelines were:

i. The sound rapport and mutual trust established between the researcher and the participants and maintained throughout the study in the field guaranteed the authenticity and trustworthiness of the data collected.

ii. Internal data triangulation among data collected from students from Africa, Asia and Europe, supported the credibility of the information obtained from the respondents. Triangulation as a method of ensuring credibility and dependability in qualitative study is supported by several scholars (e.g. Cresswell 2002; Begley 1996b; Tobin and Begley, 2002 as cited in Tobin and Begley, 2004, p.400).

iii. Respondent or member validation carried out ensured that the investigator correctly understood the social world investigated. This respondent or member check is in line with the suggestion of Bryman and Bell (2011) that the establishment of credibility of findings entails both making sure that research is carried out according to the principles of good practice and submitting research findings to the members of the social world who were studied for confirmation that the investigator has correctly understood that social world. Members check as a way of ensuring the validity of research findings in qualitative approach was also confirmed by Lincoln and Guba (1985 cited in Tobin and Begley, 2004).

## 4.16 Ethical Considerations

Ethical considerations were taken into account throughout this study to ensure that confidentiality of the research participants was guaranteed and also that the rights of the research participants were respected. To protect the participants and also ensure that the data needed for arriving at meaningful findings were generated, the following ethical considerations were taken into account during the design, development and implementation of the qualitative interview (Henning, 2004; Mason, 2002 as cited in Korpel, 2005, p.116):

- The respondents were required to give informed consent indicating that they would like to participate in the research. In order to do this, they needed to understand that their privacy and sensitivity was protected and what the outcome of the research would be used for. Prospective participants were also informed about the procedure and the risks in the research, and given the option of choosing to participate or not.
- Consent was given by responding to open invitation to participate in the research.
- The researcher aimed to treat all content with utmost discretion and ensured that no specific individual would be implicated through the result of the study.
- The creation of a protected environment that allowed for freedom of speech and the sharing of open and honest views, allowed the researcher to generate richer data.
- It was important to the researcher that the respondents enjoyed the process and felt that they also benefited from it.
- Information generated from the interviews was protected from unauthorised persons.
- Participants were deemed capable of making informed decision regarding participation in the research study.

Also, the researcher took into account during the interview the measures suggested by some scholars (e.g. Krueger and Casey, 2000; Greenbaum, 1998; Mason, 1994) as what constitute ethical considerations in qualitative research. These measures include:

**i** The proceedings and content discussed  were kept secret.

**ii** Participant(s) were free not to respond to any question they did not feel like consenting to answer.

**iii** Any materials that were left in the facility after the interview and seen to contain any part of the information discussed were completely destroyed.

**vi** Respondents were given the opportunity to reflect on what they felt rather than what they thought the researcher wanted to hear.

**vii** It was expected of the participants not to discuss the content of the interview with any person outside the interviewer and interviewee after completion of the session. Therefore, the researcher made the participants to understand that their potential identities will not be revealed to anyone. In order to ensure the protection of the identities of the participants, pseudonyms or any symbol preferred by a participant in the qualitative interview was used to cite quotations. In addition, the researcher informed the participants that they were important for the success of this study and that their signatures on the consent form indicated their willingness to participate in the research without coercion. Consequently, they were free to withdraw their consents and hence, their participation at any point in time.

Furthermore, participants were informed in advance that the researcher may wish to record the interview and that any participant that did not wish to be recorded was free to indicate so. Such participant(s) was interviewed without recording but that the researcher sought permission to write down the contributions of such participants in any other form. Thus, confidentiality was given priority attention by the researcher. Participants were made aware that details of the recording will be kept in a safe place which only the researcher has access to. Additionally, only information pertaining to the analysis of material was discussed in confidence with appropriate professionals in my field as well as my supervisor, purely for academic purposes (Bhana, 2007). The results that were obtained after the analysis were made available to any of the participants on request. In addition, participants were made to understand from the beginning that this study does not appear to have risk factors. There was no reported risk arising from the study at the time of writing this report.

In summary, pragmatism was the research philosophy that guided this study. This philosophy involves the use of mixed methods research, combining quantitative and qualitative approaches in one study. The use of this method was informed by the nature of the subject of investigation, the research questions and the researcher's worldview. The researcher believed that the mixed methods could help capture the breadth and depth of information needed for

making a valid conclusion in this study. Also, proper ethical considerations were taken into account during and after the data gathering processes, analysis and reporting of findings. The next chapter focussed on data presentation and analysis. In the next chapter, the qualitative and quantitative data are presented and analysed. At this stage, data from qualitative interviews and the quantitative survey are integrated at the levels of data presentation, analysis and discussion of findings.

# Chapter Five

## Data Presentation and Analysis

## [Findings]

### 5.1 Introduction

The data collected in the course of carrying out this study are presented and analysed in this chapter. The first set of data presented and analysed was the demographic data. This set of data gave information about the age brackets of the research participants, sex, race and educational levels. These variables were included to enable the researcher find out their relationships with transformation towards sustainable living. To make these relationships clearer, tables, and charts are used where appropriate.

Presentation and analysis of demographic data was followed by the presentation and analysis of data collected using the quantitative approach. This data was collected through survey research. After analysis of the quantitative data and testing of the hypothesis, the qualitative data collected using interview method was analysed. The results obtained from the two sources of data were integrated at the discussion stage to see the areas of agreements and contradictions. In the process of the analysis, meanings were deduced from the data and explained by way of interpretations.

## 5.2 Section A: Presentation and Analysis of Quantitative Data

## 5.2.1 Hypothesis Testing – Analysis, Results and Interpretations

**Ho:** University education under Global Education does not transform learners to live sustainably [Null Hypothesis]

**H1:** University education under Global Education transforms learners to live sustainably [Alternative Hypothesis]

### 5.2.2 Operational Definitions

| | | |
|---|---|---|
| ID | - | Respondent ID [1, 2, 3,…370] |
| Gender | – | Male [1] and Female [2] |
| Age | - | 16 and Above |
| Race | - | Africa [1], Asia [2] and European [3] |
| Continuous Variables - | | Q5 – Q20 [Survey Questions] |

The survey questionnaire contains 25 items, a sample size of 370 respondents ranging from 16 of age and above from different races and educational levels and targeted mainly students from university education.

The 25 items in the questionnaire was structured and measured into three types which contain both independent and dependent variables. The Category type [1 to 5] has the demography of the individual respondents from the survey in the questionnaire [Age range, Gender, Educational level, Race, and ID] which were measured as either **scale** or **nominal** data.

The remaining 6 – 20 items [Q1 – Q20] were questions characterised in the survey as **ordinal data** (level of measure). However, the data from the survey was not nominally distributed; hence the idea of using both a **parametric** and **non-parametric** approach was considered in order to compare the outcome (results) of both analyses.

### 5.2.3 Test Statistics

The test of statistics was based on the 370 respondents that took part in the study out of the targeted 400 participants. The frequency calculations and cumulative frequencies arrived at in the tables showing demographic information were based on the achieved population sample of 370 respondents. This sample size was considered sufficient to generate the data required for this study which considered global spread of the research population. This conclusion was reached because other studies that had international bearing had used either data below or approximately within the same range (e.g Fuchs, 2014).

The decision rules for the acceptance of any result of hypothesis test are:

**1.** "If the p-value for the calculated sample value of the test statistic is less than the chosen significance level α, reject the null hypothesis at significance level α.

$$\text{P-value} < \alpha \Rightarrow \text{reject H0 at significance level } \alpha.$$

**2.** If the p-value for the calculated sample value of the test statistic is greater than  or equal to the chosen significance level α, retain (i.e., do not reject) the null  hypothesis at significance level α.

P-value ≥ α ⇒ retain H0 at significance level α." (Abbot, n.d).

The significance level chosen for this statistical test is P-value less than or equal to 0.05

**Step 1- Descriptive Statistics –** Using the frequency technique to determine the nature of the sample population (Demography) distribution

It could be important to note that statistical analysis in this study was simply used as an objective aid to making subjective decisions. In support of this approach, Gibbons and Pratt (1975, p.21) stated that "In many investigations, the decision to be reached ultimately is not a statistical one but a practical one. Then the statistical result should be considered no more than an objective aid to the formation of subjective decision". Thus, the authors concluded that statically significance does not necessarily mean that the answer(s) arrived at has practical significance. This is because the decision making process is frequently influenced by several other factors in addition to the P-value (Gibbons and Pratt, 1975).

**Table 5.1: Statistical Average of Sample Population based on Demographic Variables**

| | | Gender | Age range of Respondent | Race | Educational Level |
|---|---|---|---|---|---|
| N | Valid | 370 | 370 | 370 | 370 |
| | Missing | 0 | 0 | 0 | 0 |
| Mean | | 1.48 | 1.31 | 1.95 | 1.99 |
| Median | | 1 | 1 | 2 | 2 |
| Mode | | 1 | 1 | 1 | 2 |
| Std. Deviation | | 0.5 | 0.707 | 0.817 | 0.127 |
| Variance | | 0.25 | 0.5 | 0.667 | 0.016 |

Table 5.1 shows the mean, median and mode of the four demographic variables – gender, age range, race and educational levels used in this study. As indicated by the mean value for gender was 1.48; age range of respondents was 1.31; race was 1.95 and educational level was1.99. Educational level has the highest mean value and this indicated that it was mostly students at the same educational level, which in this study was university students,

participated in the study. This was significant going by the fact that the focus of the study was the experience of students in the university.

**Table 5.2: Frequency Table of Gender of Participants**

| Gender | | | | | |
|---|---|---|---|---|---|
| Gender | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | **Male** | 194 | 52.4 | 52.4 | 52.4 |
| | **Female** | 176 | 47.6 | 47.6 | 100 |
| | **Total** | 370 | 100 | 100 | |

Table 5.2 showed that with a sample size (N) of 370 respondents, 194 were males and 176 females representing about 52.4% and 47.6% of the total population respectively. The result as indicated in the table showed that the number of male students that took part in the research was more than the number of the female students by 18. This difference was considered as insignificant and therefore did not have much effect on the attempt to achieve gender balance.

**Table 5.3:  Frequency of Age Distribution of Participants**

| Age range of Respondent | | | | | |
|---|---|---|---|---|---|
| Age Range | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | **16 – 24** | 290 | 78.4 | 78.4 | 78.4 |
| | **25 – 33** | 60 | 16.2 | 16.2 | 94.6 |
| | **34 – 42** | 12 | 3.2 | 3.2 | 97.8 |
| | **43 – 51** | 5 | 1.4 | 1.4 | 99.2 |
| | **52 – 60** | 1 | 0.3 | 0.3 | 99.5 |
| | **61 - Above** | 2 | 0.5 | 0.5 | 100 |
| | Total | 370 | 100 | 100 | |

Table 5.3 shows that 290 respondents representing 78.4% were between the age of 16-24; The number of respondent between the age of 25-33 were 60 representing 16.2%; Those between the age of 34-42 were 12 representing 3.2%; There were 5 students representing 1.4% between the age of 43-51; The number of respondents between the age of 52-60 was 1 representing 0.3%; those 61 years and above were 2 representing 0.5% of the 370 respondents.

**Table 5.4: Race of Participants**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| | | | **Race** | | |
| Valid | Afro-Caribbean | 132 | 35.7 | 35.7 | 35.7 |
| | Asian | 123 | 33.2 | 33.2 | 68.9 |
| | European | 115 | 31.1 | 31.1 | 100 |
| | Total | 370 | 100 | 100 | |

Table 5.4 showed that 132 students representing 35.7% were from Africa; 123 representing 33.2% were from Asia; 115 representing 31.1% were from Europe. The largest number of participants came from Africa and Asia. This was significant in order to measure the level of transformation students from developing countries experience when they come to developed countries for study. Moreover, this category of students constitutes the bulk of international students which formed the focus of this study.

**Table 5.5: Educational Level of Participants**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| | | | **Educational Level** | | |
| Valid | College | 5 | 1.4 | 1.4 | 1.4 |
| | University | 364 | 98.4 | 98.4 | 99.7 |
| | 3 | 1 | 0.3 | 0.3 | 100 |
| | Total | 370 | 100 | 100 | |

Table 5.5 shows the frequency of the response categories in this study. The categories were college students, university students and form three students. However, the college students were simply included as a standard for measuring the level of transformation that global education as practiced in the university impacts on university students. Thus, the number of college and form three students was not large.

## Step 2: Inferential Statistics Using Cross-Tabulation and Chi-Square Test

Test to find out if there was any statistically significant difference or relationship between two or more category variables using cross-tabulation chi-square and correlation test.
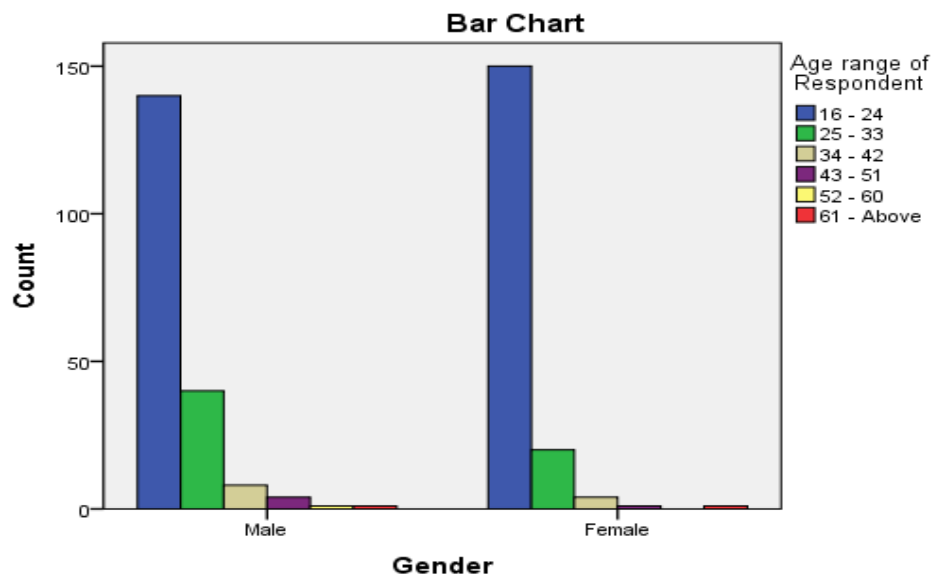
**Figure 5.1: Gender and age of respondents**

The graph shows that the highest number of respondents was between the ages of 16-24. This was the case for both genders. Those between the ages of 25-33 were the second largest respondents that participated in this study. This number was followed by those between the age of 34-42; 43-51; 52-60; 61 and above. This distribution indicated that the university has more students between the ages of 16-24 than in other age brackets. By implication, young people are more in the university than older people.

The Pearson-chi square tests for the gender reflection of age range of respondents showed a value of 10.294 with a significant level of .067. The symmetric measures showing the Pearson's R (interval by interval) and Spearman correlation (ordinal by ordinal) that determined the chi-square test result for gender and age respectively were shown in tables 2 and 3 and Figure 1 which showed graph of this distribution (See table 2 and 3 in Appendix 1 and Figure 1 in Appendix 2).

The outcome obtained indicated that 52.40% (194) of total respondents were male while 47.60% (176) were females. About 290 respondents of both male and female were between the ages of 16 – 24years. The Pearson Chi-Square value is 10.294 with 5 degree of freedom and a P-value of 0.067 or a probability of 6.7% of getting the P-value in a sample of 370 Population. This means that there is no statistically significant association between the two variables

The Pearson's R (Interval by Interval) from the symmetric measure showed a negative value

of -0.136 and a P-value of 0.009 (0.9%). This result indicates that the strength of association between the two variables is very weak with the probability of 0.9% in every 370 population sample Thus, an increase in one variable's value, leads to a decrease in the values of the second variable. Hence, its suggests that there is no statistically significant association between the two variables that suggest the number of male participants within the age range will increase with same number of female participants in every 370 population.

**Table 5.6: Educational Level and Race of Participants**

| Educational Level * Race Cross-Tabulation | | | | | |
|---|---|---|---|---|---|
| | | Race | | | Total |
| | | African | Asian | European | |
| Education al Level | College | 1 | 3 | 1 | 5 |
| | University | 131 | 120 | 113 | 364 |
| | 3 | 0 | 0 | 1 | 1 |
| Total | | 132 | 123 | 115 | 370 |

Table 5.6 shows that 1 African respondent was in the college; 131 were in the university; 3 Asian were in the college; 120 were in the university; 1 European was in the college; 113 were in the university; I European was in Form 3. The chi-square test for educational level of participants showed a value of 3.855 with 4 degree of freedom and a P-value of 0.426 or a probability of 42.6% of getting the P-value in a sample of 370 Population. This means that there is no statistically significant association between the variables. Similarly, the Pearson's R (Interval by Interval) from the symmetric measure showed a positive value of 0.021 and a P-value of 0.683 (68.3%).

This result shows that the strength of association between the variables is very strong with the probability of 68.3% in every 370 population sample. Thus, an increase in one variable's value, leads to an increase in the values of the second variable. Hence, it suggests that there is no statistically significant association between the two variables, races and educational level.

**Table 5.7: Educational Level and Age Range of Respondents**

| Educational Level * Age range of Respondent Cross-tabulation | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Age range of Respondent | | | | | | Total |
| | | **16 - 24** | **25 - 33** | **34 - 42** | **43 - 51** | **52 - 60** | **61 - Above** | |
| Education al Level | **College** | 3 | 1 | 0 | 1 | 0 | 0 | 5 |
| | **University** | 286 | 59 | 12 | 4 | 1 | 2 | 364 |
| | **3** | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| Total | | 290 | 60 | 12 | 5 | 1 | 2 | 370 |

The table shows that 3 respondents between the age of 16-24 were in the college, 286 were in the university, 1 was in Form 3, For those between 25-33years, 1 respondent was in the college; 59 in the university; for respondents between 34-42 years, 12 were in the university; for those between the age of 43-51, 1 was in the college, 4 were in the university; those between 52-60 years, 1 was in the college, and for respondents between the ages of 60 years and above 2 were in the university.

Test of association to find out if there was any relationship in association between the age group and educational level showed that the Pearson Chi-Square value is 13.783 with 10 degree of freedom and a P-value of 0.183 or a probability of 18.3% of getting the P-value in a sample of 370 Population. This means that there is statistically significant association between the two variables Age and educational level (See table 6 in Appendix 1).

The Pearson's R (Interval by Interval) from the symmetric measure shows a negative value of -0.084 and a P-value of 0.108 (10.8%). This result indicated the strength of association between the two variables and showed that the strength of association between the variables is very weak with the probability of 10.8% in every 370 population sample (See table 7 in Appendix 1). Thus, an increase in one variable's value, leads to an increase in the values of the second variable. Hence it suggests that there is no statistically significant relationship between the two variables, races and educational level and the level of association is very weak.

**Table 5.8: Gender * Educational Level Cross-tabulation**

| Gender * Educational Level Cross-tabulation | | | | | |
|---|---|---|---|---|---|
| | | Educational Level | | | Total |
| | | College | University | 3 | |
| Gender | Male | 3 | 191 | 0 | 194 |
| | Female | 2 | 173 | 1 | 176 |
| Total | | 5 | 364 | 1 | 370 |

Table 5.8 shows that 3 male respondents were in the college; 191 were in the university; 2 female respondents were in the college; 173 were in the university; 1 was in Form 3. Test of association, if there was any relationship in association between the Gender and Educational Level showed that The Pearson Chi-Square value is 1.217 with 10 degree of freedom and a P-value of 0.544 or a probability of 54.4% of getting the P-value in a sample of 370 Population. This means that there is statistically significant association between the two variables Gender and educational level (See table 8 in Appendix 1)

The Pearson's R (Interval by Interval) from the symmetric measure showed a positive value of 0.039 and a P-value of 0.460 (46.0%). This result indicates the strength of association between the two variables is very weak with the probability of 46.0% in every 370 population sample. It suggests that there is a statistically significant and weak association between the two variables, Gender and educational level (See table 9 in Appendix 1).

**Table 5.9: Does educational level enhances sustainable living?**

| Crosstab | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Does education enhances sustainable living | | | | | Total |
| | | Strongly Disagree | Disagree | Undecided | Agree | Strongly Agree | |
| Educational Level | College | 0 | 0 | 0 | 1 | 4 | 5 |
| | University | 1 | 1 | 19 | 198 | 145 | 364 |
| | 3 | 0 | 0 | 0 | 1 | 0 | 1 |
| Total | | 1 | 1 | 19 | 200 | 149 | 370 |

The table showed that 1 college student agreed with the proposition; 4 strongly agreed; I respondent in the university strongly disagreed; 1 disagreed; 19 undecided; 198 agreed, 145 strongly agreed; 1 Form 3 student agreed. The number of university students that were of the opinion that university education enhanced the understanding of sustainability was high. This result indicates that students understand more about sustainability at university level. This

view was corroborated by the result obtained from the qualitative interview. A participant in the study said:

> "Yes, the understanding of sustainability depends on the level of education – college students or university students. If you know the importance of protecting the environment, you will do it yourself. To some degree, for example, if I have primary school education, it is highly difficult for me to realise the importance of protecting the environment. I think for primary school students, it will be hard to think of protecting the environment".

The opinion of this student agreed with the views of Chalkley (2006) that the most valuable contribution of Higher Education to sustainability is that it provides a large number of graduates with the knowledge, skills and values that help business, government and the whole society to engage in a more sustainable way of living and still ensure steady economic growth. However, rudimentary education remains fundamental to the understanding of sustainability.

Findings from this study showed that such knowledge prepares students to accept new experiences in a confident and intellectually curious way, develop intellectual foundation communicated mostly through subject-based teaching. This suggests that it will not be out of place to teach elementary form of sustainability at lower level of education (Franz Furedi cited in Wegimont, 2013, p.200). Thus, teaching sustainability education at all levels could be a better way of laying a strong foundation for educating students at higher levels about sustainability.

Test of association, if there was any relationship in the opinion that educational level enhances sustainable living indicated that the Pearson Chi-Square value is 4.197 with 8 degree of freedom and a P-value of 0.839 or a probability of 83.9% of getting the P-value in a sample of 370 Population. This means that there is statistically significant association between the two variables (See table 10 in Appendix 1).

The Pearson's R (Interval by Interval) from the symmetric measure showed a negative value of -0.092 and a P-value of 0.077 (7.7%). This result indicates the strength of association between the two variables and shows that the strength of association between the variables is very weak with the probability of 7.7% in every 370 population sample. It suggests that there is a very weak statistically significant relationship that educational level enhances sustainable living (See table 11 in Appendix 1).

**Table 5.10: How does Race enhance education in sustainable living?**

| Crosstab | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Does education enhances sustainable living | | | | | Total |
| | | Strongly Disagree | Disagree | Undecided | Agree | Strongly Agree | |
| Race | Afro-Caribbean | 1 | 0 | 6 | 68 | 57 | 132 |
| | Asian | 0 | 0 | 7 | 70 | 46 | 123 |
| | European | 0 | 1 | 6 | 62 | 46 | 115 |
| Total | | 1 | 1 | 19 | 200 | 149 | 370 |

Table 5.10 showed that 1 respondent from Africa strongly disagreed with the view that the race a leaner comes from could help in making education to enhance sustainable living; 6 undecided, 68 agreed, 57 strongly agreed. From Asian countries, 7 respondents were undecided; 70 agreed; 46 strongly agreed; from European countries, 1 disagreed; 6 undecided; 62 agreed; 46 strongly agreed.

Test of association, if there was any relationship in the opinion that race and educational level enhance sustainable living indicated that the Pearson Chi-Square value is 5.061 with 8 degree of freedom and a P-value of 0.751 or a probability of 75.1% of getting the P-value in a sample of 370 Population. This means that there is statistically significant association between the two variables (See table 12 in Appendix 1).

The Pearson's R (Interval by Interval) from the symmetric measure showed a negative value of -0.023 and a P-value of 0.659 (65.9%). This result indicates the strength of association between the two variables is very weak with the probability of 65.9% in every 370 population sample (See table 13 in Appendix 1). It suggests strongly that there is a statistically significant relationship in the opinion that Race and educational level enhance sustainable living.

**Table 5.11: Race * Learning develops students to think sustainably.**

| | | Learning develops students to think sustainably | | | | | Total |
|---|---|---|---|---|---|---|---|
| | | Strongly Disagree | Disagree | Undecided | Agree | Strongly Agree | |
| Race | Afro-Caribbean | 3 | 8 | 30 | 70 | 21 | 132 |
| | Asian | 3 | 11 | 29 | 59 | 21 | 123 |
| | European | 1 | 16 | 33 | 46 | 19 | 115 |
| Total | | 7 | 35 | 92 | 175 | 61 | 370 |

Table 5.11 shows that 3 respondents from Afro-Caribbean countries strongly disagreed, 8 disagreed, 30 undecided, 70 agreed, 21 strongly agreed; 3 from Asian countries strongly disagreed; 11 disagreed; 29 undecided, 59 agreed, 21 strongly agreed; 1 from European countries strongly disagreed; 16 disagreed; 33 undecided, 46 agreed; and 19 strongly agreed. The sample distribution of races is shown in the graph below:
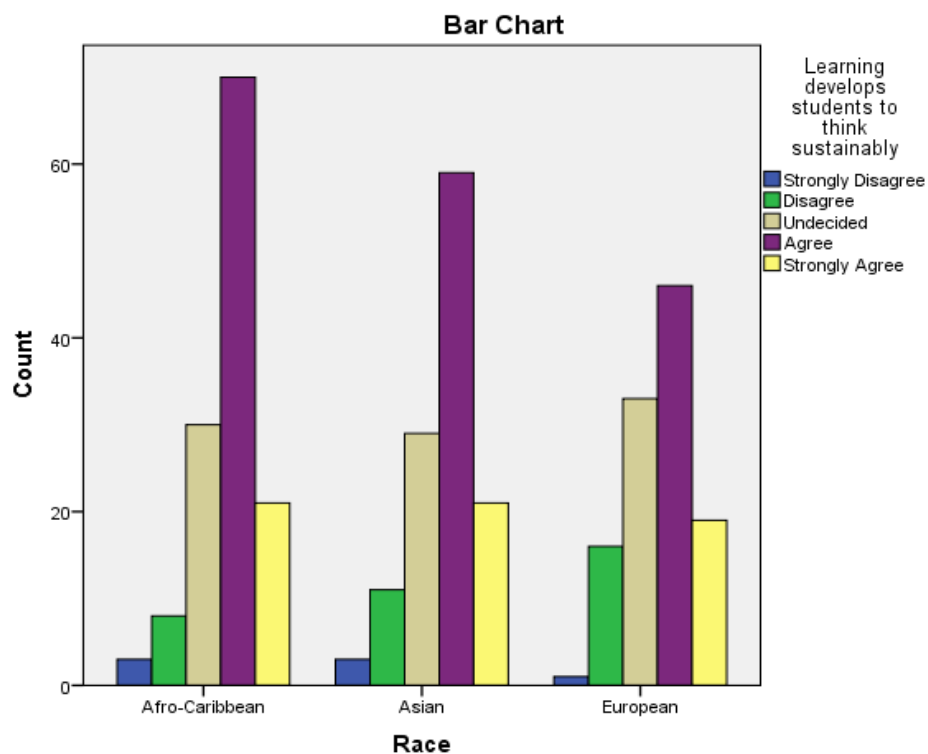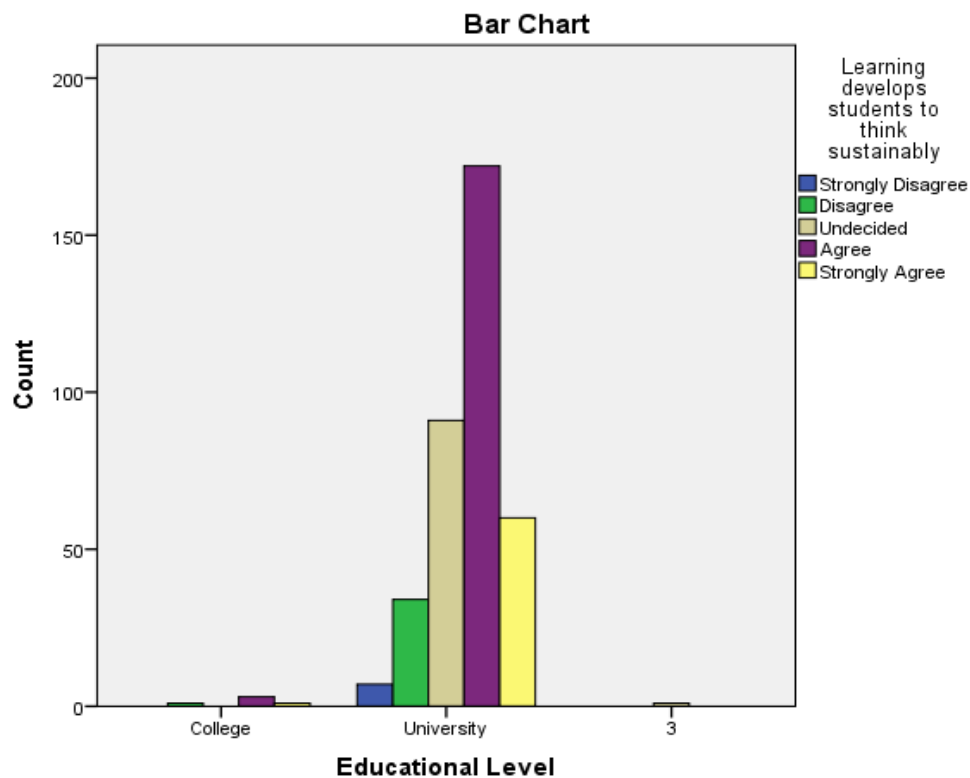


**Figure 5.2: Learning develops students to think sustainably based on race**

The graph shows that majority of the respondents from each of the three races agreed that learning develops students to think sustainably. These responses agreed with Daloz (1990) that higher education possesses the power to plant the seed of conscientization, understanding, insight and transformation by enhancing positive thinking in the learners and enabling learners develop multiple perspectives, engage in dialogue and construction of knowledge.

Test of association, if there is any relationship in the opinion that the race students come from could assist in making education to develop students to think sustainably showed that the Pearson Chi-Square value is 8.269 with 8 degree of freedom and a P-value of 0.408 or a probability of 40.8% of getting the P-value in a sample of 370 Population. This means that there is no statistically significant association between the two variables (See table 14 in Appendix 1).

The Pearson's R (Interval by Interval) from the symmetric measure shows a negative value of -0.074 and a P-value of 0.156 (15.6%). This result indicates the strength of association between the two variables is very weak with the probability of 65.9% in every 370 population sample. It suggests strongly that there is no statistically significant relationship in the opinion that Race and Learning develop students to think sustainably but the level of association is very weak in strength with a probability of 15.6% (See table 15 in Appendix 1).

Also, a test of association between learning develops students to think sustainably based on educational level indicated that majority of university students were of the view that learning assists students at university to think sustainably (See tables 16 and 17 in Appendix 1). The results obtained from the test are shown in Figure 5.3 below:

**Figure 5.3: Educational level is important in developing students to think sustainably.**

The graph shows that majority of the respondents at university was of the opinion that learning develops students to think sustainably.

**Table 5.12: Race * Students transformed by course contents**

| Crosstab | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Students transformed by course content | | | | | Total |
| | | Strongly Disagree | Disagree | Undecided | Agree | Strongly Agree | |
| Race | Afro-Caribbean | 1 | 17 | 35 | 66 | 13 | 132 |
| | Asian | 2 | 16 | 25 | 58 | 22 | 123 |
| | European | 4 | 18 | 31 | 41 | 21 | 115 |
| Total | | 7 | 51 | 91 | 165 | 56 | 370 |

Table 5.12 indicated that 1 respondent from Afro-Caribbean countries strongly disagreed with the proposition that students are transformed by course contents to live sustainably; 17 disagreed; 35 undecided, 66 agreed; 13 strongly agreed. Among the respondents from Asian countries, 2 strongly disagreed; 16 disagreed; 25 undecided, 59 agreed, 22 strongly agreed.

From European countries, 4 strongly disagreed; 18 disagreed; 31 undecided; 41 agreed, 21 strongly agreed out of 370 respondents.
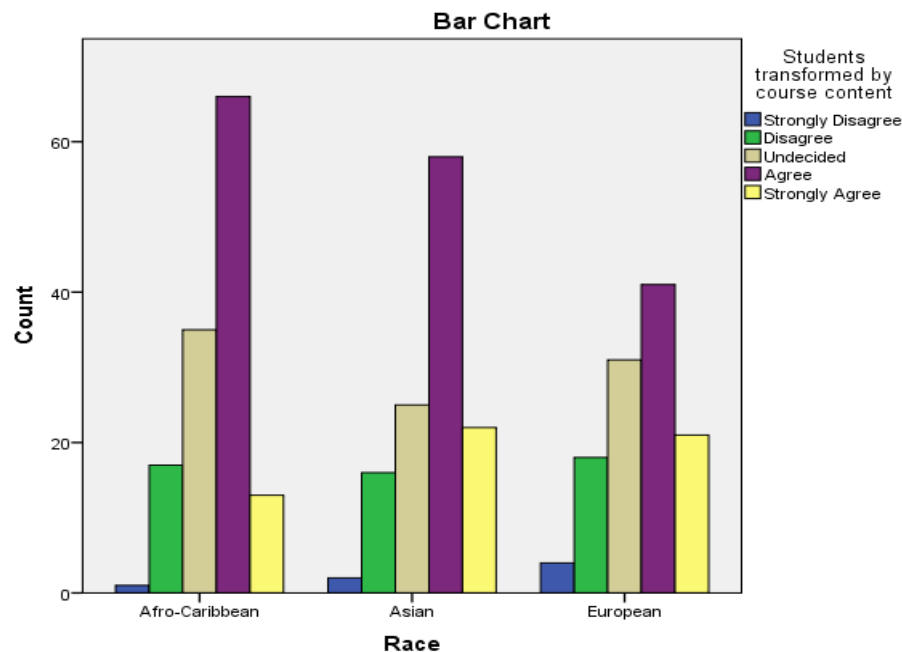


**Figure 5.4: Students transformation by course contents based on race**

The graph shows that the highest number of respondents that expressed the view that student is transformed by course contents to live sustainably were those from Africa, followed by respondents from Asian countries. The least number were from European countries. Test of association between the variables indicated that the Pearson Chi-Square value is 11.170 with 8 degree of freedom and a P-value of 0.192 or a probability of 19.2% of getting the P-value in a sample of 370 Population. This means that there is no statistically significant association between the two variables (See table 19 in Appendix 1).

The Pearson's R (Interval by Interval) from the symmetric measure shows a negative value of -0.021 and a P-value of 0.681 (68.1%). This result indicates the strength of association between the two variables is strong with the probability of 65.9% in every 370 population sample (See table 20 in Appendix 1). This result suggests strongly that *there is no statistically significant relationship in the opinion that Race and students are transformed by course content*.
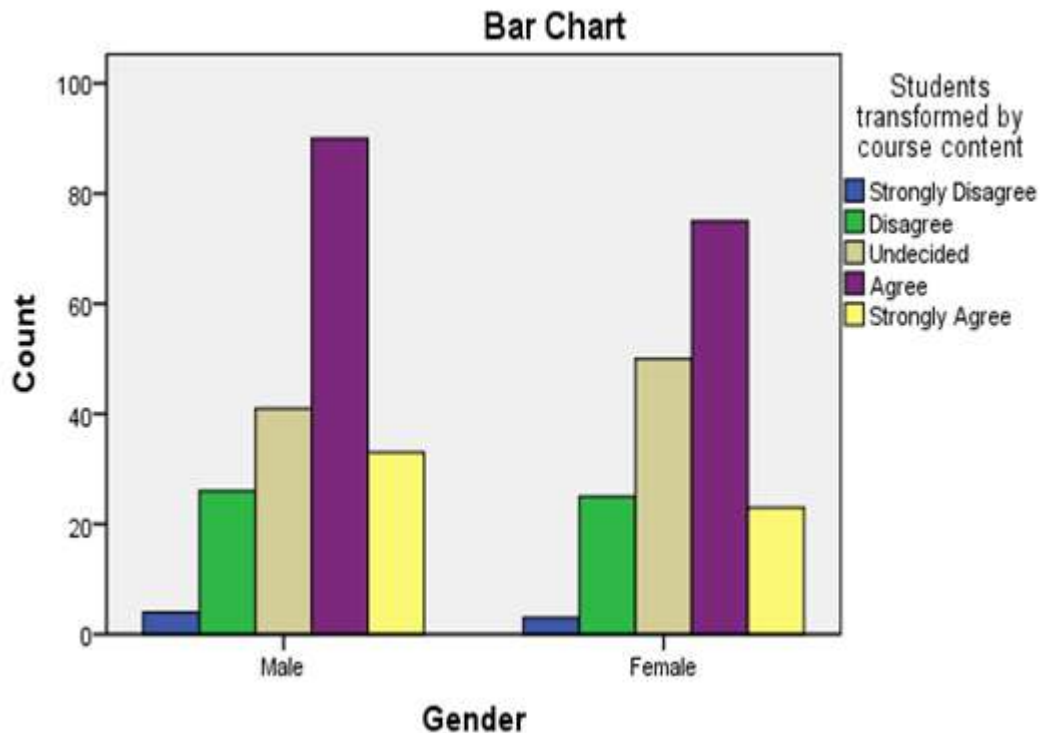
**Figure 5.5: Students transformed by course contents based on gender opinion**

The graph shows that the number of male and female respondents that were of the opinion that students were transformed by course contents towards sustainable living was higher than the numbered that did not share the view (See also tables 21, 22 and 23 in Appendix 1).

Test of relationship between the variables showed that the Pearson Chi-Square value is 3.334 with 4 degree of freedom and a P-value of 0.504 or a probability of 50.4% of getting the P-value in a sample of 370 Population. This means that there is no statistically significant association between the two variables. The Pearson's R (Interval by Interval) from the symmetric measure shows a negative value of -0.061 and a P-value of 0.245 (24.5%). This result indicates the strength of association between the two variables is strong with the probability of 65.9% in every 370 population sample. It suggests strongly that there was statistically significant relationship in the opinion based on gender that students were transformed by course contents but the level of association is very weak.

With regard to how much university education make students to protect the society and environment, responses from participants in this study showed that education help students to

protect the environment. This result is indicated in Figure 5. 6 (See also table 30 in Appendix 1).
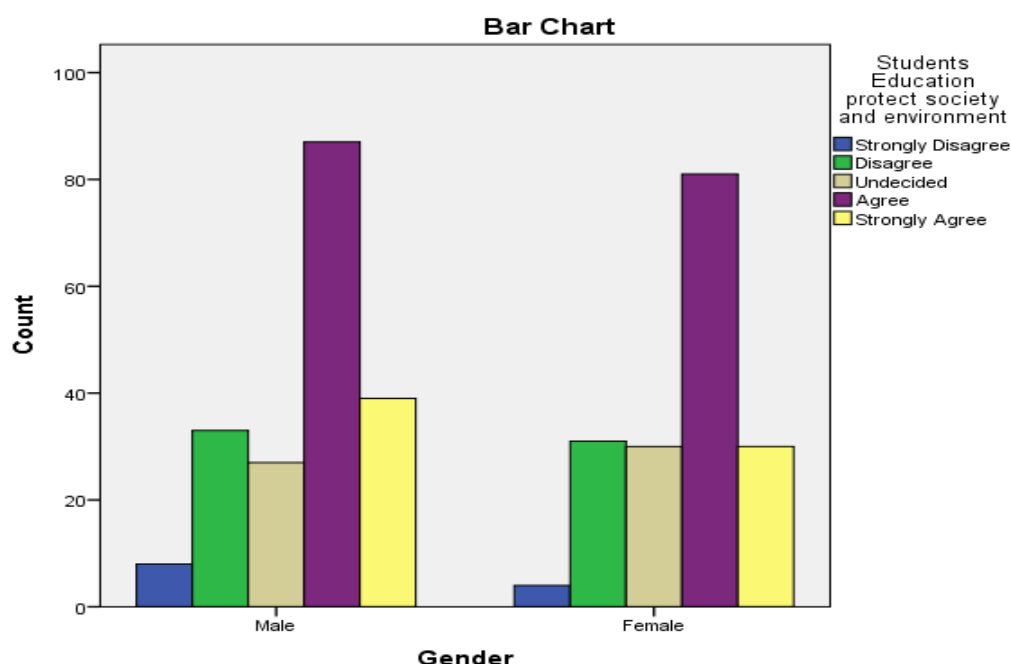


**Figure 5.6: Gender views on education of students help them to protect society and environment**

The graph showed that the number of both male and female respondents that were of the opinion that global education prepares learners to protect society and environment was higher than the number that did not share the opinion. Test of association between the variables indicated that the Pearson Chi-Square value is 2.071 with 4 degree of freedom and a P-value of 0.723 or a probability of 72.3% of getting the P-value in a sample of 370 Population. This means that there is no statistically significant association between the two variables (See table 24 in Appendix 1)

The Pearson's R (Interval by Interval) from the symmetric measure shows a negative value of -0.009 and a P-value of 0.870 (87.0%). This result indicates the strength of association between the two variables is strong with the probability of 87.0% in every 370 population sample (Table 25 in Appendix 1). It suggests strongly that there is no statistically significant relationship in the opinion expressed by both gender that students are transformed by course content.

**Table 5.13: Race * Transformation and sustainability needs more explanations at university based on race of students**

| | | Transformation and sustainability needs more explanations | | | | | Total |
|---|---|---|---|---|---|---|---|
| | | **Strongly Disagree** | **Disagree** | **Undecided** | **Agree** | **Strongly Agree** | |
| Race | **Afro-Caribbean** | 4 | 5 | 28 | 79 | 16 | 132 |
| | **Asian** | 0 | 4 | 29 | 71 | 19 | 123 |
| | **European** | 1 | 6 | 31 | 57 | 20 | 115 |
| Total | | 5 | 15 | 88 | 207 | 55 | 370 |

Table 5.13 shows that 4 respondents from Afro-Caribbean countries strongly disagreed with the proposition that transformation and sustainability needs more explanations at university; 5 disagreed; 28 undecided; 79 agreed; 18 strongly agreed. From Asian countries, 4 disagreed; 29 undecided, 71 agreed, 19 strongly agreed. Among the respondents from European countries, 1 strongly disagreed; 6 disagreed; 31 undecided, 57 agreed, 20 strongly agreed.
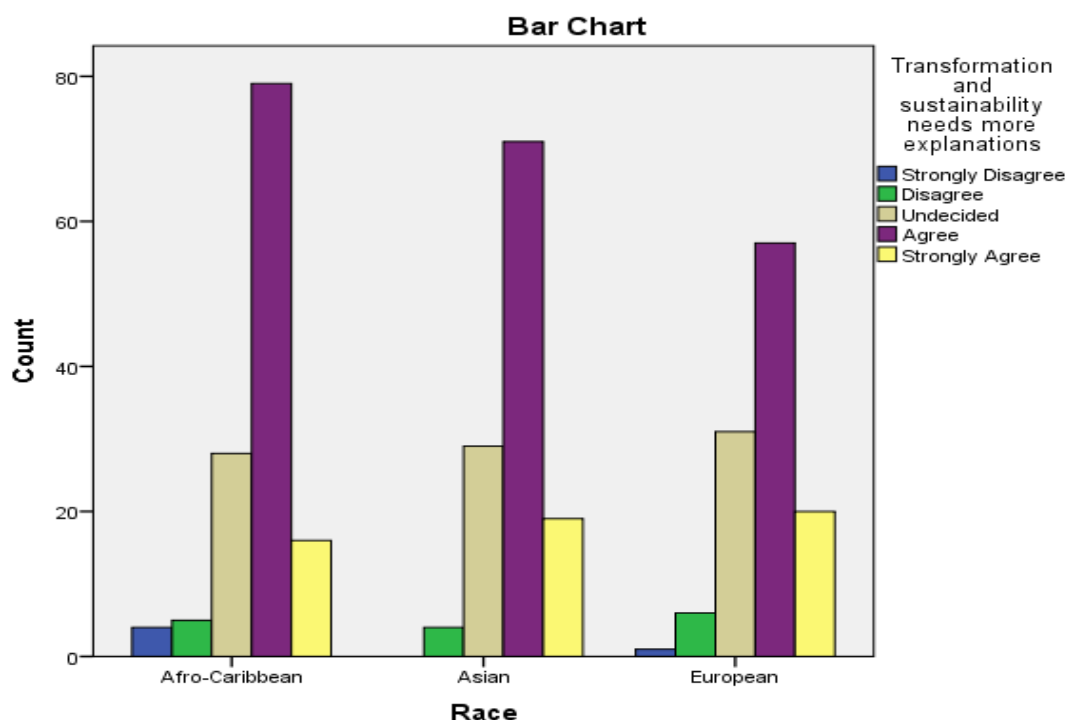


**Figure 5.7, Views based on race for transformation and sustainability need more explanations at university**
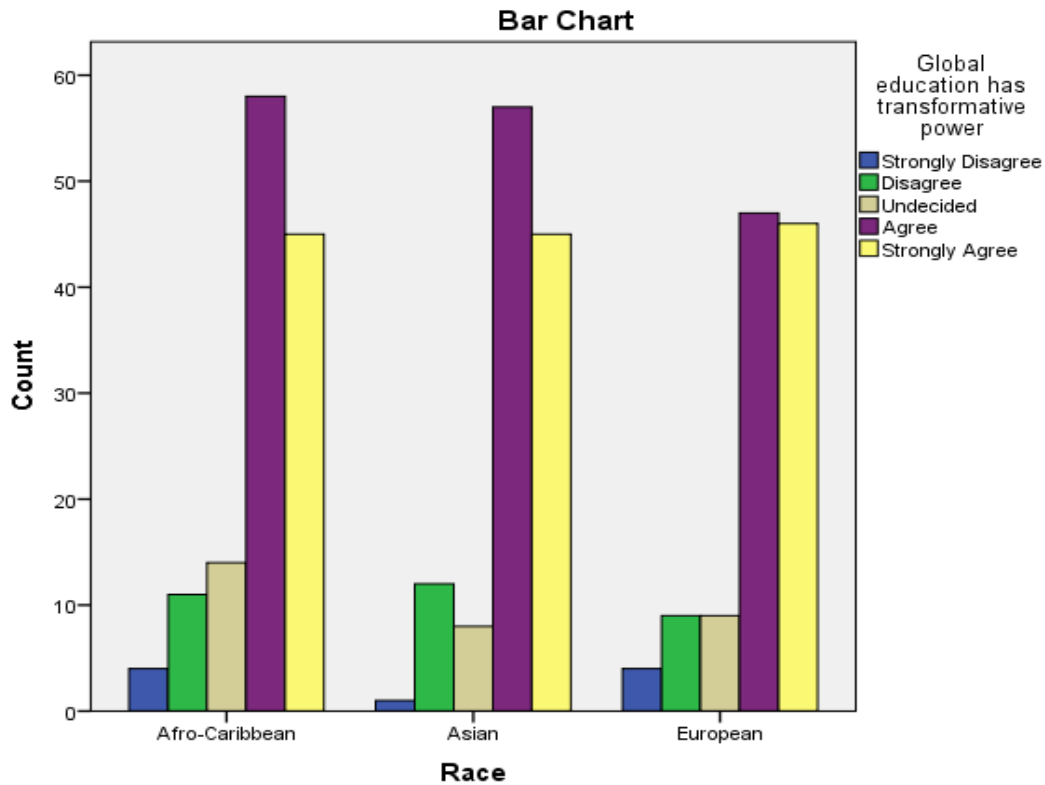
The graph shows that majority of the respondents from the three races agreed that transformation and sustainability need more explanation at the university. Test of relationship between the variables showed that the Pearson Chi-Square value is 8.527 with 8 degree of freedom and a P-value of 0.384 or a probability of 38.4% of getting the P-value in a sample of 370 Population. This means that there is no statistically significant association between the two variables (See tables31 and 32 in Appendix 1).

The Pearson's R (Interval by Interval) from the symmetric measure showed a positive value of 0.018 and a P-value of 0.723 (72.3%). This result indicates the strength of association between the two variables is very strong with the probability of 72.3% in every 370 population sample  It suggests strongly that there is no statistically significant relationship in the opinion that race and transformation and sustainability need more explanation.

## Table 5.14: Race * Global education has transformative power

| Crosstab | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Global education has transformative power | | | | | Total |
| | | Strongly Disagree | Disagree | Undecided | Agree | Strongly Agree | |
| Race | Afro-Caribbean | 4 | 11 | 14 | 58 | 45 | 132 |
| | Asian | 1 | 12 | 8 | 57 | 45 | 123 |
| | European | 4 | 9 | 9 | 47 | 46 | 115 |
| Total | | 9 | 32 | 31 | 162 | 136 | 370 |

Table 5.14 shows that 4 respondents from Afro-Caribbean countries strongly disagreed with the proposition that global education has transformative power; 11 disagreed; 14 undecided; 58 agreed, 45 strongly agreed. From Asian countries, 1 respondent strongly disagreed; 12 disagreed; 8 undecided; 57 agreed; 45 strongly agreed. Among respondents from European countries, 4 strongly disagreed, 9 disagreed; 9 undecided; 47 agreed; 46 strongly agreed.

**Figure 5.8: The transformative power of global education**

The graph shows that majority of respondents from the three races agreed that global education has transformative power. Test of association between the variables indicated that the Pearson Chi-Square value is 4.649 with 8 degree of freedom and a P-value of 0.794 or a probability of 79.4% of getting the P-value in a sample of 370 Population. This means that there is statistically no significant association between the two variables (See tables 33 and 34 in Appendix 1)

The Pearson's R (Interval by Interval) from the symmetric measure shows a positive value of 0.035 and a P-value of 0.502 (50.2%). This result indicates the strength of association between the two variables is very strong with the probability of 50.2% in every 370 population sample  It suggests strongly that there is no statistically significant relationship in the opinion that race and global education has transformation power.

**Table 5.15:  Race * Students are completely transformed to live sustainably**

| | | | Students are completely transformed to live sustainably | | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | | | Strongly Disagree | Disagree | Undecided | Agree | Strongly Agree | |
| Race | Afro-Caribbean | | 5 | 8 | 35 | 52 | 32 | 132 |
| | Asian | | 1 | 11 | 36 | 55 | 20 | 123 |
| | European | | 0 | 4 | 31 | 53 | 27 | 115 |
| Total | | | 6 | 23 | 102 | 160 | 79 | 370 |

The table shows that 5 respondents from Afro-Caribbean countries strongly disagreed with the proposition that students are completely transformed by global education to live sustainably; 8 disagreed; 35 undecided; 52 agreed; 32 strongly agreed. From Asian countries, 1 respondent strongly disagreed; 11 disagreed; 36 undecided; 55 agreed; 20strongly agreed. Then from European countries, 4 respondents disagreed, 31 undecided; 53 agreed and 27 strongly agreed.

Test of association between the variables indicated that the Pearson Chi-Square value is 12.418 with 10 degree of freedom and a P-value of 0.258 or a probability of 25.8% of getting the P-value in a sample of 370 Population. This means that there is no statistically significant association between the two variables. The Pearson's R (Interval by Interval) from the symmetric measure shows a positive value of 0.068 and a P-value of 0.190 (19.0%). This result indicates the strength of association between the two variables is very weak with the probability of 19.0% in every 370 population sample  It suggests strongly that there is no statistically significant relationship in the opinion that race and students are completely transformed to live sustainably and the level of association is very weak.

On whether university needs a better way of teaching students about sustainability, majority of the students agreed that university needs to search for a better way of teaching students about sustainability. The responses of participants that indicated that the way sustainability is taught at university needs to be re-examined is shown in Figure 5.9 (See also tables 35, 36, and 37 in Appendix 1).
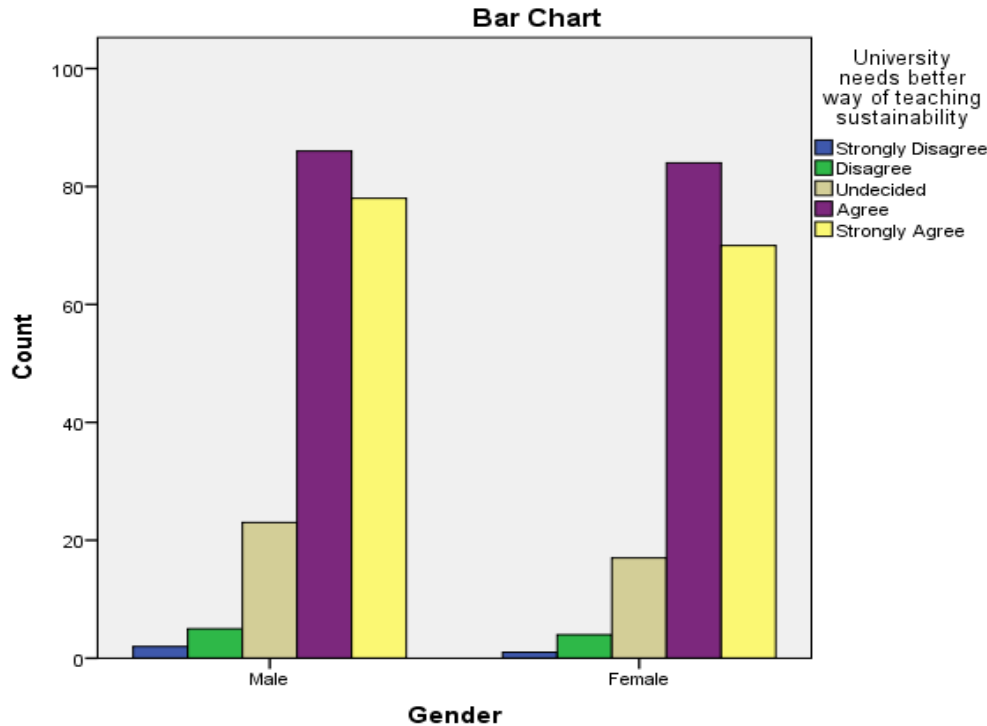
**Figure 5.9: Gender views on university needs better way of teaching sustainability.**

The graph shaowS that majority of both male and female respondents were of the opinion that universty needs better way of teaching sustainability. Test of association between the variables showed that the Pearson Chi-Square value is 9.27 with 4 degree of freedom and a P-value of 0.921 or a probability of 92.1% of getting the P-value in a sample of 370 Population. This means that there is no statistically significant association between the two variables

The Pearson's R (Interval by Interval) from the symmetric measure shows a positive value of 0.024 and a P-value of 0.650 (65.0%). This result indicates the strength of association between the two variables is strong with the probability of 65.0% in every 370 population sample. It suggests strongly that there is no statistically significant relationship in the opinion that gender and university need better way of teaching sustainability and the level of association is strong.

**Table 5.16: Race * Global education enhances sustainable living based on race**

| | | **Crosstab** | | | | | |
|---|---|---|---|---|---|---|---|
| | | does education enhances sustainable living | | | | | Total |
| | | Strongly Disagree | Disagree | Undecided | Agree | Strongly Agree | |
| Race | Afro-Caribbean | 1 | 0 | 6 | 68 | 57 | 132 |
| | Asian | 0 | 0 | 7 | 70 | 46 | 123 |
| | European | 0 | 1 | 6 | 62 | 46 | 115 |
| Total | | 1 | 1 | 19 | 200 | 149 | 370 |

Table 5.16 shows that 1 respondent from Afro-Caribbean country strongly disagreed with the statement that global education enhances sustainable living, 6 undecided; 68 agreed; 57 strongly agreed. From Asian country, 7 respondents were undecided; 70 agreed; 46 strongly agreed. Among the respondents from European countries, 1 disagreed; 6 undecided; 62 agreed; 46 strongly agreed. Test of association between the variables indicated that the Pearson Chi-Square value is 5.061 with 8 degree of freedom and a P-value of 0.751 or a probability of 75.1% of getting the P-value in a sample of 370 Population. This means that there is statistically no significant association between the two variables (see tables 40 and 41 in Appendix 1).

The Pearson's R (Interval by Interval) from the symmetric measure shows a negative value of -0.023 and a P-value of 0.659 (65.9%). This result indicates the strength of association between the two variables is strong with the probability of 65.9% in every 370 population sample. It suggests strongly that there is statistically no significant relationship in the opinion that race and educational level enhance sustainable living and the level of association is strong.
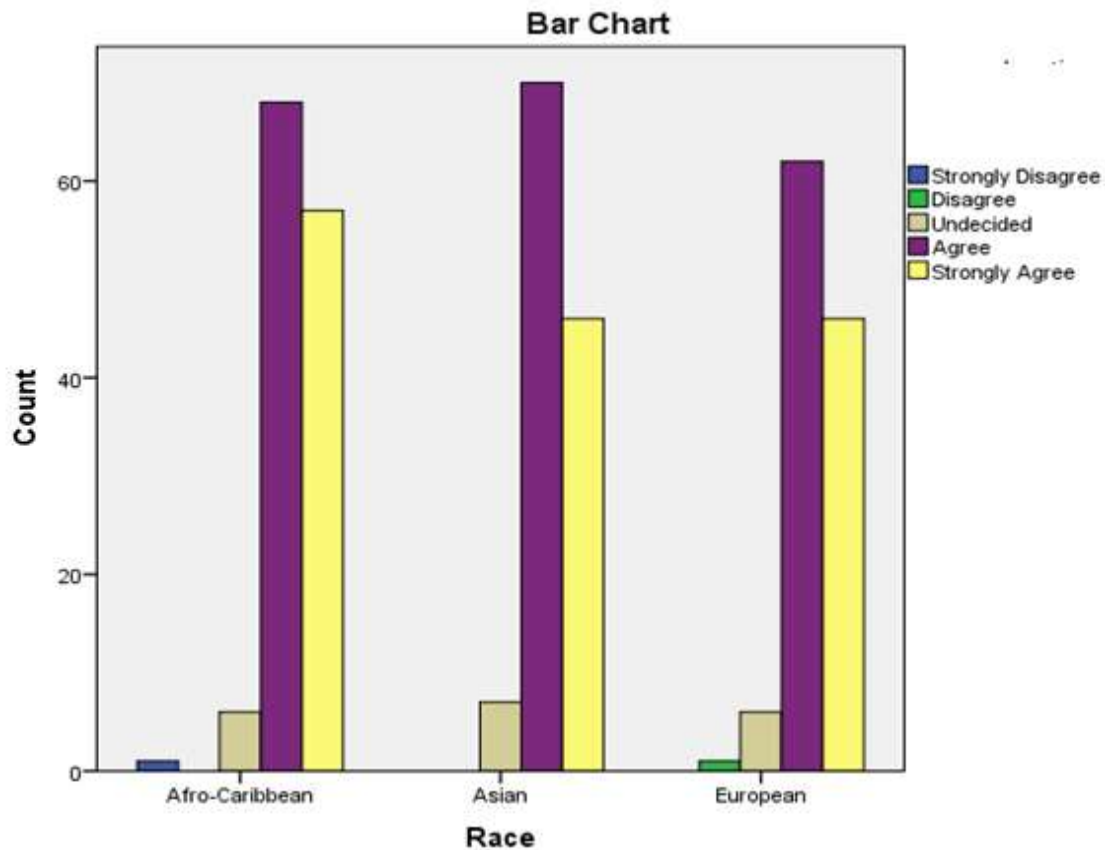
**Figure 5.10: Global education enhances sustainable living.**

The graph shows that majority of the respondents from the Afro-Caribbean countries, Asians and those from European countries agreed that global education enhances sustainable living. The highest number that agreed with the proposition was from Asian countries, followed by respondent from Afro-Caribbean countries and the least number was from respondents from European countries. This suggest that students from developing countries and emerging economies experience transformation towards sustainable living under global education system more than those from developed countries.

# 5.3 Step 2 – Inferential Statistics (correlation)

**Test of difference between two variables using Paired T-Test (Bivariate)**

**i)        Correlations – Educational level * Q2 * Q18**

**Table 5.17: Tests of correlations between educational level, sustainable living and mixed race university**

| Descriptive Statistics | | | |
|---|---|---|---|
| | Mean | Std. Deviation | N |
| Education al Level | 1.99 | 0.127 | 370 |
| does education enhances sustainabl e living | 4.34 | 0.613 | 370 |
| Mixed race university transform s students to live sustainabl y | 3.89 | 0.961 | 370 |

Table 5.17 shows the relationship between global education and transformation towards sustainable living. It measured the opinion of participants with respect to how much educational level and students from diverse cultures coming together to study in the same university transform students toward sustainable living, and juxtaposed the mean results with the key issue about global education's transformation of students to live sustainably. The mean results obtained for education level was 1.99,  and for global education enhances sustainability was 4.34 and mixed race university transforms students to live sustainably was 3.34.  The mean results of 4.34 and 3.34 indicate strongly that global education transforms students towards sustainable living.

**Table 5.18: Results for correlations between educational level, sustainable living and mixed race university**

| Correlations | | Educational Level | does education enhances sustainable living | Mixed race university transforms students to live sustainably |
|---|---|---|---|---|
| Educational Level | Pearson Correlation | 1 | -.092 | .102 |
| | Sig. (2-tailed) | | .077 | .051 |
| | N | 370 | 370 | 370 |
| does education enhances sustainable living | Pearson Correlation | -.092 | 1 | .203** |
| | Sig. (2-tailed) | .077 | | .000 |
| | N | 370 | 370 | 370 |
| Mixed race university transforms students to live sustainably | Pearson Correlation | .102 | .203** | 1 |
| | Sig. (2-tailed) | .051 | .000 | |
| | N | 370 | 370 | 370 |

Correlation is significant at the 0.01 level (2-tailed).

If there is/are any statistical significant to suggest that educational level enhances and transforms students in a mixed race university to live sustainably

i) **Educational level: does education enhances sustainable living?** *(A Negative correlation and no statistical significant, hence reject the null hypothesis)*
Pearson Correlation value = -**0.092** indicating a negative correlation which means that as one variable increases in value, the second variable decreases in value *(that is as the educational level increases, the value of other variable decreases).*

The P-Value = 0.077 (Sig. Value)
If P value $\leq$ 0.05 we can conclude that there is a statistically significant correlations between the two variables, this means an increases or decreases in one variable do significantly relate to increases or decreases in the second variable.

If the P-Value > 0.05 we can conclude that there is no statistically significant correlation between the two variables. Which means, increases or decreases in one variable do not significantly relate to increases or decreases in the second variable

ii) **Educational level: does education enhances sustainable living?** *(A positive correlation but no statistical significant hence Reject Null hypothesis)*

The P-Value = 0.051 (Sig. Value) and Pearson Correlation value = 0.102

iii) **does education enhances sustainable living: Mixed race university transforms students to live sustainably** *(A positive correlation and a statistically significant hence, Accept the Null Hypothesis)*

The P-Value = 0.000 (Sig. Value) and Pearson Correlation value = 0.203**

**Table 5.19: Correlations – Educational level * Race * Q20**

| Descriptive Statistics | | | |
|---|---|---|---|
| | Mean | Std. Deviation | N |
| Education al Level | 1.99 | 0.127 | 370 |
| Race | 1.95 | 0.817 | 370 |
| Students are completely transform ed to live sustainabl y | 3.76 | 0.921 | 370 |

Table 5.19 shows that the mean for educational level and race for question 20 was 1.99; race was 1.95; and students are completely transformed to live sustainably was 3.76.

**Table 5.20: T-Test – if there is any significant difference between the variables at 95% confidence intervals**

| Paired Samples Statistics | | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Pair 1 | Educational Level | 1.99 | 370 | .127 | .007 |
| | Students are completely transformed to live sustainably | 3.76 | 370 | .921 | .048 |
| Pair 2 | Race | 1.95 | 370 | .817 | .042 |
| | Mixed race university transforms students to live sustainably | 3.89 | 370 | .961 | .050 |
| Pair 3 | Gender | 1.48 | 370 | .500 | .026 |
| | Global education has transformative power | 4.04 | 370 | 1.009 | .052 |

Table 5.20 shows the results of T-test carried out to determine if they were any significant differences between the variables: educational level, students are completely transformed, race, mixed race university, gender and global education has transformative power. The mean results of 3.76 for students are completely transformed, 3.89 for mixed race university transforms students and 4.04 for global education has transformative power all indicates strong relationship between global education and transformation of learners. At significant level of 0.05 (i.e. 95% confidence interval), it can be concluded that the variables shown in table 5.20 above are all significant in the transformation of students towards sustainable living.

**Table 5.21: Paired sample correlations for educational level and complete transformation of students; race, gender and mixed race university transform students; global education has transformative power**

| | Paired Samples Correlations | | | |
|---|---|---|---|---|
| | | N | Correlation | Sig. |
| Pair 1 | Educational Level & Students are completely transformed to live sustainably | 370 | .047 | .363 |
| Pair 2 | Race & Mixed race university transforms students to live sustainably | 370 | -.020 | .702 |
| Pair 3 | Gender & Global education has transformative power | 370 | .056 | .287 |

Table 5.21 shows the paired sample correlations for educational level and sustainability; race and mixed race university; gender and global education

*Note*
Where, t-value is the degree of freedom (df) and P-value is significance level (sig. 2 tailed)

**If p > 0.05,** we can conclude that *there is no statistically significant difference between the two variables*, hence it implies that the differences between the two variable "Means" are likely due to change.

**But If p < 0.05**
We can conclude that *there is a statistically significant difference between the two variables*. Which deduce that the differences between the two variable "Means" are not likely due to change.

**Table 5.22: Paired sample correlations results for transformation: educational level, complete transformation of students; race and mixed race university; global education**

| | Paired Samples Test | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | | Lower | Upper | | | |
| Pair 1 | Educational Level - Students are completely transformed to live sustainably | -1.773 | .924 | .048 | -1.867 | -1.679 | -36.916 | 369 | .000 |
| Pair 2 | Race - Mixed race university transforms students to live sustainably | -1.941 | 1.274 | .066 | -2.071 | -1.810 | -29.305 | 369 | .000 |
| Pair 3 | Gender - Global education has transformative power | -2.562 | 1.101 | .057 | -2.675 | -2.450 | -44.775 | 369 | .000 |

Table 5.22 shows for educational level - students are completely transformed to live sustainably; race – mixed race university transforms students to live sustainably; gender – global education has transformative power.

i)     **Educational level: student are completely transformed [Pair 1]**

At 95% confidence interval, the test value **(t)** is -**36.916** and the **P-Value is 0.000**, with a mean value of -1.773 and std. D of 0.924. Since the P-value is less than 0.0005. (p < 0.0005) We can conclude that *there is a statistically significant difference between the two variables*. Which deduce that the differences between the two variable "Means" are not likely due to change.

*t(369) = -36.916, p-value 0.000 (sig. 2-tailed) < 0.005*

ii)    **Race:  Mixed race university transforms students to live sustainably [Pair 2]**

 At 95% confidence interval, the test value **(t)** is -**29.305** and the **P-Value is 0.000**, with a mean value of -1.941 and std. D of 1.274. Since the P-value is less than 0.0005, (p < 0.0005) we can conclude that *there is a statistically significant difference between the two variables*. Which deduce that the differences between the two variable "Means" are not likely due to change

*t(369) = -29.305, p-value 0.000 (sig. 2-tailed) < 0.005*

iii)   **Gender:  Global education has transformative power [Pair 3]**

At 95% confidence interval, the test value **(t)** is -**44.775** and the **P-Value is 0.000**, with a mean value of -2.562 and std. D of 1.101. Since the P-value is less than 0.0005. (p < 0.0005) We can conclude that *there is a statistically significant difference between the two variables*. Which deduce that the differences between the two variable "Means" are not likely due to change

*t(369) = -44.775, p-value 0.000 (sig. 2-tailed) < 0.005*

Note: the correlation table shows there is no significant correlation between the variables

**Table 5.23: Paired sample T-Test for change in attitude and transformation; sustainable living and knowledge and skills from university; age range and behaviour change**

**T-Test**

| | | | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|---|
| | **Paired Samples Statistics** | | | | | |
| Pair 1 | Any change in attitude towards sustainable living | | 3.87 | 369 | .854 | .044 |
| | Students transformed by education to think sustainably | | 3.64 | 369 | .951 | .050 |
| Pair 2 | Learning develops students to think sustainably | | 3.67 | 370 | .925 | .048 |
| | Students transformed by knowledge and skills from university | | 4.01 | 370 | .965 | .050 |
| Pair 3 | Age range of Respondent | | 1.31 | 370 | .707 | .037 |
| | Sustainability achieved by behaviour change | | 4.06 | 370 | .934 | .049 |

Table 5.23 shows the mean for any change of attitude towards sustainable living; learning develops students to think sustainably; students are transformed by the knowledge and skills from university, and sustainability is achieved by behaviour change based on age.

**Table 5.24: Paired sample correlations for change in attitude and transformation; learning and knowledge and skills from university; age range and sustainability**

| | | N | Correlation | Sig. |
|---|---|---|---|---|
| | **Paired Samples Correlations** | | | |
| Pair 1 | Any change in attitude towards sustainable living & Students transformed by education to think sustainably | 369 | .269 | .000 |
| Pair 2 | Learning develops students to think sustainably & Students transformed by knowledge and skills from university | 370 | .053 | .313 |
| Pair 3 | Age range of Respondent & Sustainability achieved by behaviour change | 370 | .035 | .499 |

Table 5.24 shows paired sample correlations for change of attitude and thinking sustainably; learning develops students to think sustainably and knowledge and skills from university, behaviour change and age of respondents.

**Table 5.25: Paired sample test for learning, change in attitude, knowledge and skills**

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | | Lower | Upper | | | |
| Pair 1 | Any change in attitude towards sustainable living - Students transformed by education to think sustainably | .228 | 1.095 | .057 | .116 | .340 | 3.995 | 368 | .000 |
| Pair 2 | Learning develops students to think sustainably - Students transformed by knowledge and skills from university | -.341 | 1.302 | .068 | -.474 | -.207 | -5.033 | 369 | .000 |
| Pair 3 | Age range of Respondent - Sustainability achieved by behaviour change | -2.751 | 1.151 | .060 | -2.869 | -2.634 | -45.967 | 369 | .000 |

*(header spanning row: Paired Samples Test)*

Table 5.25 shows paired sample test for change of attitude towards sustainable living; learning develops students to think sustainably; students are transformed by the knowledge and skills from university, and sustainability is achieved by behaviour change based on age of respondents at 95% confidence interval of difference.

i) **Any Change in attitude towards sustainable living \* Student transformed by education to think sustainable**

At 95% confidence interval, the test value **(t) is 3.995** and the **P-Value is 0.000**, with a mean value of 0.228 and std. D of 1.095. Since the P-value is less than 0.0005. (p < 0.0005) We can conclude that *there is a statistically significant difference between the two variables*. Which deduce that the differences between the two variable "Means" are not likely due to change

$$t(368) = 3.995, \text{p-value } 0.000 \text{ (sig. 2-tailed)} < 0.005$$

ii) **Learning develops students to think sustainably \* Students transformed by knowledge and skills from university**

At 95% confidence interval, the test value **(t) is -5.033** and the **P-Value is 0.000**, with a mean value of -0.341 and std. D of 1.302. Since the P-value is less than 0.0005. (p < 0.0005) We can conclude that *there is a statistically significant difference between the two variables*.

Which deduce that the differences between the two variable "Means" are not likely due to change

$$t(368) = -5.033, \text{ p-value } 0.000 \text{ (sig. 2-tailed)} < 0.005$$

**iii)     Age range of Respondent  * Sustainability achieved by behaviour change**

At 95% confidence interval, the test value **(t)** is **-45.967**and the **P-Value is 0.000**, with a mean value of -2.751 and std. D of 1.151. Since the P-value is less than 0.0005. ($p < 0.0005$) We can conclude that *there is a statistically significant difference between the two variables*. Which deduce that the differences between the two variable "Means" are not likely due to change.

$$t(368) = -45.967, \text{ p-value } 0.000 \text{ (sig. 2-tailed)} < 0.005$$

**Table 5.26: Contingency table for the Likert values (Source: Authors source): showing the frequency distribution of participants' responses to the questionnaire.**

| Question No. | SA | A | U | DA | SD |
|---|---|---|---|---|---|
| 1 | 185 | 171 | 7 | 4 | 3 |
| 2 | 149 | 200 | 19 | 1 | 1 |
| 3 | 77 | 197 | 70 | 21 | 5 |
| 4 | 99 | 182 | 51 | 35 | 3 |
| 5 | 94 | 184 | 55 | 33 | 4 |
| 6 | 148 | 170 | 40 | 9 | 3 |
| 7 | 82 | 206 | 56 | 18 | 8 |
| 8 | 19 | 58 | 48 | 167 | 78 |
| 9 | 61 | 175 | 92 | 35 | 7 |
| 10 | 124 | 171 | 35 | 35 | 5 |
| 11 | 56 | 165 | 91 | 51 | 7 |
| 12 | 128 | 171 | 43 | 20 | 8 |
| 13 | 54 | 191 | 68 | 50 | 7 |
| 14 | 69 | 168 | 57 | 64 | 12 |
| 15 | 55 | 207 | 88 | 15 | 5 |
| 16 | 132 | 175 | 22 | 35 | 6 |
| 17 | 136 | 162 | 31 | 32 | 9 |
| 18 | 101 | 174 | 51 | 40 | 4 |
| 19 | 45 | 82 | 57 | 100 | 86 |
| 20 | 79 | 161 | 102 | 23 | 5 |

The values in the table were used to test the hypothesis test the hypotheses. The table shows that there were 20 questions in the questionnaire instrument.

## 5.4 Test of Key Hypothesis

To test the hypothesis, software – Mathematica, was used. At 95 degree of freedom (0.005) the standard deviation obtained was 535.257 and the resulting mean was 107.051. This indicated that the number of students that agreed that university education under global education field transforms learners to live sustainably was significantly higher than the number that did not agree. The result of the test showed the chi square value to be 5901.8.

Since the chi square value 5901.8 is greater than the table value 16.91898, the null hypothesis (Ho) was rejected and the alternative hypothesis ($H_I$) was accepted. Thus, it was concluded that university education under the Global Education system transforms learners to live sustainably.

To confirm the results obtained from the analysis of quantitative data, the responses of the participants that took part in personal interview carried out in the course of this study were explored in more details and presented in qualitative form. This was done by relating the responses of the students that took part in the interview to the key research objectives and questions with a view to finding out the relationships between what the interviewees said the research questions put forward for this study. The analysis of this qualitative data is presented in section B below:

## 5.5 Section B: Qualitative Analysis, Results and Interpretations

### 5.5.1 Testing the Relationship between Global Education and Transformation of Learners towards Sustainable Living

Respondents to the research question that was used to test the relationship between global education and transformation towards sustainable living indicated that they had different experiences of transformation towards sustainable living. The accounts of their experiences varied based on their cultural backgrounds. Thus, those from Afro-Caribbean countries expressed similar views while respondents from European countries had views different from the views of those from developing and emerging economies of the world. Themes identified in relation to research question one which this test was based on were four: *transformation, creating awareness, small things that matter and prior knowledge of sustainability.*

## 5.5.2 Transformation

Transformation was understood by the respondents as change from unsustainable pattern of living to living sustainable lifestyle. Respondents from Africa and Asian countries generally said that their ways of living have been substantial transformed. This change was evidenced in the statement made by respondent 'A', to the interview question, *what kinds of transformation have taken place in your life as a result of your studying at Anglia Ruskin University?* He said,

> "I have experienced a lot of changes in the five years I have been in this school. Yes, you know in Africa where I come from, we care less about sustainability. Yes, to be honest I have been transformed. First, the level of education I have received has changed my behaviours. I am informed, so I am transformed. Now because I am aware of the implications of unsustainable living, it is now my responsibility to tell others, and also to avoid doing the same thing. So, in that case I will try as much as I could when I go back to Nigeria to help encourage people to live sustainably".

He went on to emphasis the level of transformation that has taken place in his pattern of living. His gesticulations and countenance together with the verbal description that came out from his deep voice suggested that real transformation that seemed irreversible had taken place in his life. In his own word, he stated, "I am really transformed. Originally, I was aware of the environment but now, my awareness has increased from awareness to transformation".

Responding to a related question, respondent 'B', a student of Business Management corroborated what respondent 'A' said. This participant was also from Africa. He presented his experience of transformation thus:

> "My transformation and my change in perception are **highly** irreversible. This is because I have come to see the implications of my past actions. So, I don't think it will be human again for me to go back to that behaviour… Reducing my carbon footprints is what I can do as an individual. First, it is going to help me. It can save me cost and resources. All so, life is all about thinking for tomorrow. If you just think about immediate needs satisfaction, you wouldn't allow for all these changes to take place in your life. But I have the vision that I am thinking about the next generation…"

The above description underpinned the level of transformation towards sustainable living experienced by respondent B. His resolve to drink his bottle of water and hold on to his stuff until he gets rubbish to put it indicated that this learner has experienced a deep level of transformation. He also wanted a freer environment than where he is living now, an environment that is free from pollution, acid rain, flooding and so on which are the

aftermaths of unsustainability. A future like the one this participant described is a possible future, that is, the future we would like to live in, if human activities on earth becomes eco-friendly (Selby, 1999).

When respondent C was asked the question, *after half a year at Anglia Ruskin University, can you say that you have experienced a kind of transformation in your way of living with respect to caring for the environment?* His answer was:

> Like I said, I cannot go now and do something like burn my clothes that I do not need. I am very sure that it is not gona be friendly to the environment. Also, in managing waste, I cannot dispose them anywhere and anyhow. For instance, I am living close to river, but I just do not throw anything into the river which we do sometimes in Nigeria. I am now aware that I need not to throw anything into the river knowing fully well that such actions could endanger aquatic lives such as fish in water and ducks that float in the river. I am now aware that such activities could be hazardous to nature.

This view is supported by the findings of Karly (2009) that in Africa, people throw wastes into a flowing river in the belief that it is an easy way of disposing of rubbish. But these wastes block the river course and cause flooding.

Research participant C, a student from Human Resource department, attested that he has experienced transformation that led to change in his attitudes towards the environment. His awareness of the implications of behaving unsustainable resulted in his making sure that he manages wastes responsibly; help to protect aquatic lives by not engaging in activities that could endanger the lives of aquatic animals. A kind of transformative learning has occurred in the life of this learner. He puts away his old assumptions of how they do thing in Nigeria and allowed his cognitive system to search for new ways of doing things. Respondent 'C' was strongly of the view that he has been transformed to a very large extent. Expressing the depth of transformation he has undergone, he said:

> "Like all the examples I have given move in one direction – that I am a transformed person. My transformation is almost 99%. I am a changed person because I know what should be done and what not ought to be done to preserve the environment. My transformation is a lifelong transformation. It is something that will stay with me forever.

Students from Africa and China have similar experience about the transformation they experience by coming to study in Europe. When a respondent from China (Respondent 'D'), a student from China was asked the same question that students from Africa addressed: *would*

*you consider your life as a person who has experienced transformation towards sustainable living? If yes, why do you think so?* His answer was:

> "Emmmm, yeea, yes, because, you know I will give you some examples. Emmmm, in my country, for secondary school students or college students, if they choose to live in school accommodation, emm, you know, we do put all the electrics and lights off by half past ten every day. But in the UK, there is no power off but I think the use of resources here is even better than China. It is ridiculous but I will say yes. In China, all people know is after half past ten, they put off their light. They do not put off light when not in use like it is done in the UK. So, more energy is wasted in China than in the UK. I mean it does not help people to save energy like here. In the UK, people know they have to power off at a certain point in time. They do it by themselves. Yes, eem, this kind of behaviour has influenced me.  Before coming to Anglia Ruskin University, I did not choose to power off when electricity is not in use. When I came to Anglia Ruskin, I still did the same for sometimes. But my other roommates or house mates chose to power off when they were not using electricity and this has influenced me. I think this kind of behaviour, if you choose to do them, I think it will be better than being forced to do it by the others".

A contradiction of the views of respondents from Africa and china arose when responded 'E' from the United Kingdom was asked similar question in a slightly different way: *when you started your course at Anglia Ruskin University, did you experience some changes in the way you cared for the environment?*  This question was a follow up question resulting from his response to an earlier question in which his response was that he has been living sustainably. In his response to this follow up question which probed to know whether the university has caused some further transformation in his pattern of living, he said "There wasn't really any change…" This indicated that students from Europe are not new to the principles of sustainable living. Perhaps, they know about it and practice it. What was not clear was the extent to which students from Europe practice sustainable living.

## 5.5.3 Awareness Creation

Creating awareness of what sustainability is all about and the implications of not living sustainably was found to be a necessary step to transforming people to live sustainably. Many of the research participants were of the opinion that the awareness about sustainability which global education approach afforded them the opportunity to experience was responsible for the change in their attitudes and behaviours. Research participant 'A' in addressing the question: *do you have any future plan on how to keep encouraging other people to live sustainably* said, "because I have seen the gains, and I have seen the changes,

and you know, because we were not aware of these things in the past, and now I am aware of them, I take step forward". By implication, this learner was made aware of what sustainability was all about by coming to study in a learning environment that has some elements of global education approach in the teaching and learning process. He resolved to go ahead to make others aware of the need to live sustainable lifestyle. In his words, he said:

> I need to help others. I need to encourage and sensitise others to make them aware of these things. This will enable them to start seeing the implications of their actions; the lifestyle they are living today. They need to know about it. We have to tell them what is wrong with their actions by making them know the implications. We have to tell them because they are not aware. I mean, the people are not informed, and when one is not informed, one is deformed. They are ignorant of the consequences of their actions. Some of them are not doing it because they are having fun doing it. They don't know what they are doing. For example, in my village the electric bulb outside is always on..."

A similar view was expressed by research participant 'C' on the importance of creating awareness about sustainable living. He believed that creating awareness helps to transform others who live unsustainable lifestyle to start living sustainably. In his words, he stated that:

> "…if I found myself in a country or in my own country where people still act unsustainably, I will help to educate them I will behave sustainably and because human beings are influenced by the social behaviours of other, my behaviour can influence those around me and make them change from unsustainable lifestyle to sustainable ways of living. I will live by example and others will follow".

This participant's planned action to make others be transformed to live sustainably could help to create a sustainable society through social learning. Social learning allows an individual to pass over traits or behaviours from one generation to the next without inheritance of underlying genes (Kobayashi, and Wakano, 2012). Participant 'C' went on to emphasis the role we can play as individuals to influence behaviours of others and transform them to live sustainably:

> "Yes, like I have said, we can contribute at individual level. For instance, I am influenced by the behaviour of people around me. So, wherever I go, I behave in sustainable manners and people around me could be influenced by that. I can on my own, whether I am aware or not aware, exhibit this sustainable character which I have acquired because they have become part of my life. So, I am transformed because I have been patterned to live a transformed life".

However, participant 'D' from China which is a different cultural background sees creating awareness fairly in a similar way but different in some aspects. He agreed that he should help

to create awareness about sustainability but argued that it was not his responsibility to do so. In his view, it is not easy to change people's attitude to make them protect the environment. He presented his views on creating awareness this way:

> "Eeeem, you know China has a large population. There is little you can do, almost nothing to change other peoples' behaviour. It is quite difficult to change individuals to protect the environment. For me, I do not give much time to protecting the environment, but I do if I have the time. However, what I do sometimes if I see people who do not care about the environment, I try to persuade them. But it is not actually my business. I just have to try and protect the environment myself and if I have any chance, I engage in cleaning up the house, making sure I bin wastes properly"

Away from China and Africa, a participant from the United Kingdom views on creating awareness indicated that he was neither involved in any way in creating awareness nor interested in any awareness campaign the university may engage in to make learners live sustainably. For instance, the response of this participant 'E' to the question: *what do you think you can do to encourage others to behave and act sustainably,* indicated that he has been doing nothing by way of creating awareness towards making people understand the need for living sustainable lifestyle:

> "To tell you the truth, I haven't been really doing anything specifically in this respect. I am not going to tell you lie about this. I haven't talked to any of my friends from either Europe or Africa or elsewhere about how to make the environment to be a better world or a better place, yea, nothing".

But contrary to the disposition of respondent 'E' to creating awareness, the counterpart from the same United Kingdom responding to a similar question said she would be 'informing people of their responsibility and talking to people about the environment". And respondent 'H' from Africa said;

> "Well, I will not keep what I have learnt just for myself alone. Not just myself. I have got to tell my friends, my siblings, my wife, my children and my brothers. In my own small way, I tell people but I don't think I tell them enough. But there is so much you can do before your start trying to change another person's life. You understand. So, I think we should be our brothers' keeper".

The different views expressed by the participants from the different cultures is a reflection of how learners intend to contribute to creating a sustainable environment in the future. Their perspectives were influenced by the level of awareness about sustainability that existed in the different cultures before their coming to the university. In Africa, much was not known about environmental sustainability and respondents from this cultural background were willing to

take home what they have learnt and also make others to be aware of their new knowledge and skills. In this regard, Participant 'B' said:

"Africa is a place where we are not sensitised about the environment. So, what I want to do is that when I go back to my country, I think the kind of campaign I am carrying out about sustainability in the UK should continue. Again, my belonging to some international organisations is also a credit and a step towards achieving these goals. What I am planning is to go back to my country and start these organisations and invite all these international organisations to come and support, help me sensitise my people;  educate people who are not aware of the risks involved in the kind of life they live today…"

But for those from the United Kingdom, many of them made it clear that they have been living sustainably before coming to the university. Thus, they do not see the much need for carrying the message of environmental sustainability to the communities they came from.


## 5.5.4 Small Things that Matter

There are small things that matter in making the planet a better place to live. Participants in this study identified these things which was summarised by a participant from China as small things that matter. *Addressing the question: when you started your course at Anglia Ruskin University, what were the new things you think you have learnt about caring for the environment,* he said:

"Yeea, I think most people here give more time to managing the environment. I have been to other countries such as Greek. Yes, people there give less time to caring for the environment. May be they do not have this kind of sense of protecting the environment. Here, you know if I go to have coffee, I see that when people use tissue; nobody chooses to leave that on the table unlike other countries I visited. Here, they choose to take their tissue and throw in the dust bin. So, yeea, this is really a small thing but we can see from the small thing that they have high sense of protecting the environment. Yeea, small things that matter"

Some things considered as not capable of causing any harm to the environment in some countries are seen as capable of endangering the environment in the United Kingdom. Research participant 'A' also mentioned some small things that matter. He said:

"Just within two months that I came, I saw that yes, this people are really conscious of their environment. At least, by sorting waste according to the type and making sure bins are everywhere, they are helping build good environment".

Sorting out wastes into recyclables and non-recyclables is an important way of saving resources. When used products are recycled, they are made usable again. This helps to

preserve resources for future use. Sorting of bins is seen as small thing and ignored by many especially in developing countries. It should however be understood that we cannot successfully get materials for recycling without separating and preserving recyclable products. Thus, this activity constitute small thing that matter.

## 5.5.5 Prior Knowledge of Sustainability

As international students come to the United Kingdom for studies, some have knowledge of what sustainability is all about whilst some do not. Many of the students, especially from the developing countries do not have prior knowledge of the practice of sustainable living. The influences of global education towards sustainable living on these two categories of people differ to some extent. Excerpt from the interviews of the international students that took part in this study indicated that much is not known about sustainability in many of the countries they came from. Research Participant 'C' said:

> "Well, to be honest, I had little or no education or knowledge of preserving the environment. Our way of life in Nigeria is such that government and people do not necessarily care about preserving the environment or sustaining it for future generations. I will give you an instance. In Nigeria that we come from, there is no stable life. What that means is that people look for alternative means of power supply (electricity) for their home use. The absence of constant and reliably power supply makes everybody to make use of generator or plant which emits gases that help to destroy ozone layer, depleting it and causing climate change and conditions that might not be favourable to the present and future generations. Though in Nigeria, we have not been experiencing much of the negative impacts of this action, with the knowledge I have gained about sustainable living in the UK, I know if things are not done in the right way, we 'gona' definitely suffer it sooner or later…"

The honest confession of Participant 'C' suggests that the people in Nigeria do not lives sustainably. Their coming to England to study offers them the opportunity to know about sustainability and try to live sustainably. The views of Participant 'C' were corroborated by the opinion expressed by Participant 'B'. He said:

> "Well, before I came to Anglia Ruskin University to study, in terms of the environment, I was not conscious of the environment. I say this because I did not have prior learning or sensitisation on the risks involved in living a certain kind of lifestyle which does not support the environment and caring for the future generation. Because I did not have that level of awareness, I didn't know about it. So, I didn't care…"

This student did not care about the environment and the protection of the future generations. This was because he was not educated to know about such things. It could be that if he had the knowledge needed to understand why he should care for the environment, he would have cared. The lack of knowledge of sustainability by this student from Africa could be attributed

to the inadequate or sometimes no education on sustainability in most of the universities in Africa. Supporting this view, The Association of African Universities (2009, p.1) identified among other things that "Most of the research in Africa has not been directed sufficiently to the search for continental solutions to health, education, water, climate change, energy and food security - all sustainable development indices". This implies that the students who study under this prevailing circumstance are not likely to have enough knowledge of how to live a sustainable lifestyle.

Participant 'C' noted that even though much is known about sustainability in Europe, it is the same people from Europe that run the multinational companies in Nigeria that cause sustainability crisis. In his words, he said:

> "The unsustainable ways of life we live in Nigeria are not environmentally friendly. It hurt me to know that it is the same people from Europe and other developed countries that form part of the group that run the companies that cause sustainability issues. It is unwelcome that the Multinational Companies that know the implications or the effects of these things, that know the harm such activities could cause to the environment and human health do these things with impunity".

This student, however, failed to tell us whether the multinational companies in Nigeria do not comply with government regulations with regard to the environment, behave differently in other countries, or whether the government and politicians together with local chiefs in the oil producing region of Nigeria are partly the problem. It could be argued that sustainable practices are not part of the trainings people from Nigeria get either from formal or informal education. In support of this view, research participant 'A' said:

> "…In the traditional setting where I grew up, when you use something and want to dispose the waste, we do not really care how we do it. You just throw what you don't want anywhere. So, in the past, I was not conscious of where I throw things. Sometimes, I can throw a bottle on the way and go my business without minding. I didn't fully have that consciousness about how to preserve the environment. Caring for the environment was not a duty for me. It was not something I saw as important. I would say my life in the past was not that much of anything environmental care, if at all there was any environmental consciousness in it".

However, in the context of agricultural practices, Africa had ways of maintaining soil fertility. There was land rotation, shifting cultivation and land fallowing in the traditional methods of agriculture in Africa. However, deforestation and cutting down of tress were common sustainability problems. In support of this finding, Van Wllgen, Le Maltre and Cowling (n.d) noted that in Africa, those that encourage the establishment of forests to reduce $CO_2$ increases have serious problems with programmes that remove trees, and thus biomass.

203

On the contrary, the research participant from India, participant 'G' said he had knowledge of sustainability back home before coming to Anglia Ruskin University. "For example, our farm machines are powered by solar energy". He explained that being an employee of an organisation that its primary business is doing business in sustainable ways, "we think green". However, he pointed out that others outside such organisation are not transformed to live sustainably. He said that individuals in India are not living sustainably. In his word:

> "Not, not, not really, not exactly. It is literally nobody. When I say nobody, I mean anybody who has not got a job has got no time to think about sustainability. They are also busy with their day to day life expenses. Solely, it is non-profit organisations and NGOs and you know, some civil societies really take interest in sustainability. So, because not everybody takes interest, pollution level is high".

India is a developing country. It is an emerging economy. While India is advancing technologically, the citizens still live like other Asian countries. Shimada and Matsuoka (2011) noted that in Asia and other developing countries, most energy sources in the home come from solid fuels such as coal, biomass (firewood, crop residue and animal dung). The Co, Nox Sox, which results from the combustion of these fuels inside residential homes in the process of cooking has an adverse impact on people's health.

## 5.6 Testing Relationship between what Learners under Global Education Learn and Sustainable Living

### 5.6.1 Sustainability in Course Contents

The responses to questions that were designed to find out whether the course contents learners are exposed to have elements of sustainability indicated mixed reactions. Some respondents said there course contents contained elements of sustainability. Others said they do not have anything related to sustainability in their course content. Respondent 'A', for example, explained that his course contents and what he is taught in school contain some elements of sustainability. He said:

> "…in the laboratory, the chemicals we use produce wastes. We sort out these wastes into solid and liquid state. Those that are dangerous to the environment are bagged for proper disposal. Some of them that could be very dangerous are further heated to reduce their impact on the environment. So, my course contains element of sustainability".

However, an English Language student who responded to a similar question said that his course does not contain anything about sustainability. Addressing the question that sought to

know whether there were some ways the lecturers in his course reflect anything about sustainability, he said:

> "Emmmm, No, No. You know my course is language. All I have learnt is about English Language. But I suggest in my opinion it is important to put something about sustainability or protecting the environment in the course module for us. So, emm, it will be helpful to have some module that has less relationship with our major course, especially when such module is of global significance like sustainability. This will help us to get out of heavy burdens of learning which we experience when we focus on our major or area of specialisation. On the other hand, it will give us the sense of protecting the environment. I think it is good".

The two views above indicate that not all the courses in the university contain something about sustainability. The implication is that while some students will gain some knowledge of sustainable living from their course contents, some others are likely to graduate without such knowledge. The appeal by this student  from the English Language Department for something about sustainability to be included in their course content is in line with Cortese (2003) view that content of education should include ways to preserve and restore cultural and biological diversity, both of which is critical to a sustainable future. Every student needs to understand the relationship between human activities and sustenance of the environment. Thus, the context of learning needs to change in order to make human/environment interdependence, values, and ethics a seamless and central part of teaching of all disciplines, instead of treating sustainability as an isolated course or module in programmes for specialists (Cortese, 2003).

Research Participant 'F' said that "A lot of things they teach us here can help the students to protect the environment". He stated that it is not only in his course but a lot of courses try to say something about the environment. This is an important development for sustainability education. This could help all students to understand that we are an integral part of nature and that ecological services are critical for human existence and students need to understand how to make the ecological and social footprint of human activity visible and as benign as possible (Chambers, Simmons, and Wackernagel 2000; Ryan and Durning 1997 as cited in Cortese, 2003). On the contrary, Research Participant 'J' said that not much is said about sustainability in his course. "It is just we have to practice reducing the use of paper. We reduce paper by using fewer handouts, more use of e-learning and submission of assignments online. These reduce waste of papers. In terms of Business Courses, we look at PESTLE Model and how environment affect business". These disagreement among the research

205

participants about the how much of sustainability is included in their course content indicates that not all causes have anything to teach the students about sustainability.

## 5.6.2 Impacts of Global Education on Learners

Interviews with the research participants revealed various ways global education influence their knowledge and enhance care of the environment. Research Participant 'A' from Africa said that he has learnt what it means to reduce carbon footprint and recycle used materials. In his words:

> "When I came to England, I saw that there are some vehicles that plied the road without fuel. They go by either bio fuels or electricity (electrically powered). In such way, they reduce carbon monoxide emission. Again, what I learnt is that even in school, or in my office, when we use papers, you put every paper you discard into a bag for recycling. This is unlike Nigeria were we throw every paper we use anywhere. This experience was really striking to me. Nothing is a waste. Water, you know, we pour away in Nigeria but here, water is recycled. So, I see that they are maximally utilising the environment".

The experiences of Participant 'A' revealed that the practice of sustainability in England is something different from what obtains in Nigeria. It indicated that both the university and the community influenced his perception about sustainable living. In line with the views of Participant 'A', Participant 'B' who also came from Africa said:

> "In fact, since I started at Anglia Ruskin University, I have become part of some organisations within the University. These organisations are active agents for caring for the environment. This has also impacted on the way I now look at the environment. As a matter of fact, it is because I study at Anglia Ruskin University that made it possible for me to belong to those organisations. Because of that, I can say that the university is giving me an opportunity to know what is caring for the environment. Now, there is a sort of a change in my life".

With respect to sustainable business practices, Participant 'B' said it was entirely the university that moulded him to think and act sustainably. He said:

> "If you bring in the aspect of sustainable business practices, I wouldn't say I had the idea from the society. This is because people do not discuss things like that very commonly in the street. So, it is mainly an idea I have got because I am a business student. I study in business school and I have been in conferences where I have met people with like minds. In these conferences, I meet people who are also very conscious about doing business in an ethical manner…So yes, the issues of business practice when

> you talk of sustainable business, doing business with focus on people, the
> planet and profit (3Ps), they have all come from the Business School…"

Participant B's experience was supported by Pappas (2012) suggestion that university needs to develop values-based sustainability content that cuts across disciplines, and takes human and technical factors into consideration as a springboard for solving sustainability issues. Participant 'B' agreed that university is playing some role like making sustainability a course of study. Some people are even getting degree in it. He, however, argued that more need to be done:

> Lecturers should teach the students in the way that could lead them to
> develop passion for sustainability. In fact, they should encourage the
> students to first of all know the danger that the life we live today is causing
> to the environment, and the need to protect the future
> environment…Transformation is something that has to do with emotion.
> Change is something that has to touch your personality; something that has
> to touch your emotions, and then you have remorse; you think about it and
> change process will begin to occur…"

Participant 'E' from Britain felt that the university is not doing much in the area of making students to know about sustainability. In his words, he said:

> "I can't say the university is doing much about the environment apart from
> the courses they provide that relate to environmental sustainability…I think,
> sometimes they get people that come in, talking to students how to live
> sustainably, not spending a lot of money. Sometimes, when they come in,
> they encourage students to buy something in plastic tins so that they can be
> recycled. That is, they encourage students to buy recyclable stuffs. So, I
> think they are trying to do something but…"

Participant 'C' from Nigeria was of the view that Anglia Ruskin University was doing enough to make students live sustainable life style. He said:

> "Knowledge is power. When we came to Anglia Ruskin University, we
> were given orientations. The university arranged people and companies who
> came and educated the 'freshers' on how to save costs and sustain the
> environment. I have had some programmes like Green Plan 2015 or
> something like that (I can't remember the exact name) championed by the
> Anglia Ruskin University Students Union. These are programmes mapped
> out for the campaign again unsustainable living... Here, we are made to
> understand that we must save energy and therefore save our paying high
> energy and water bills. If we are not educated this way, we incur more costs
> for ourselves. These are some of the things we learnt when we came in"

## 5.7 Contributions of Global Education to Sustainability Practices

Research participants were of the opinion that global education enhances understanding of global issues. With regard to sustainability issues, Participant 'A' was of the opinion that global education made him see the practice of sustainable living in action. He said:

> "If I did not come to the UK, I would have not known all about these things I told you. May be I could read about them somewhere, but seeing it being practiced and generally accepted, makes a lot of difference. Now, I have seen it that it is possible to sort wastes accordingly no matter the size of the population; that wastes can actually be managed It is all about awareness. So, it is really something that global education is doing. Then, it's something that we need to ask people like you that are environmentally conscious to go back home and preach to people, especially our youths to imbibe the spirit of environmental sustainability; contributing to this environmental awareness".

The suggestion that students need to take the message of what they have learnt about sustainability back to their various countries indicated the preparedness of learners to be agents of change. This suggests that the responsibility of the educated with those who do not have access to higher education is to spread what they have learnt about sustainability to them.

Participant 'C' said:

> "Iinternational education or global education as you called it has transformed my pattern of living. In the place I work, there are industrial wastes. You cannot just throw it anywhere you like. There must be properly disposed. Every waste has where it should be disposed and I make sure I dispose waste properly. For example, some chemicals we use in preserving garments and laces cannot be disposed into rivers because if we do, it could be hazardous to life and habitats in the river. Such things are awareness created by the education I received or by the knowledge I gained from university. They are the direct impact of global education".

Participant 'D' felt that the impact global education will have on learners with respect to transformation towards sustainable living depends on how much global education that is practiced in the country the students come from. In his words, he said:

> "Emmmmm, I think it depends on the countries that come together under global education. If it is Britons, Americans, or developed countries, they have already known the bad influence of climate change. These counties have high sense or consciousness of protecting the environment. And then, if other international students come to their country, there high sense of protecting the environment will influence them. Personally…"

He advised that the practice of global education should continue. In his words, he said:

> "There is need to continue the practice of global education. Let students from countries that do not know much about certain global issues like sustainability keep going for higher studies in advanced countries. They will learn from those countries where the people have high consciousness of protecting the environment. Perhaps, global education has influenced international students. Yes, I said yes."

Participant 'G' said that global education enables students to share ideas with their colleagues from other cultures. In his words, he stated:

> "Like now, we are here, people from different societies and cultures, we can share ideas. I can bring my ideas, my ways of thinking. How do I live normal day to day life? How do you live normal day to day life? When people from different parts of the world come together, they share their views, their concepts and ideas together; and from seeing how people from different cultures is behaving, one of the best ways of doing things comes out.

Participant 'B' was of the opinion that the issue of sustainability of the environment is not frequently discussed among university students. He said: "We don't have such issues discussed always. And even if they are discussed, it is now a question of certain individuals seeing the importance and forming associations, forming different organisation that go by different names". By implication, sustainability issues are discussed by organisations at university. Individuals do not often talk about sustainability when they are with friends or colleagues.

## 5.8 Testing Relationship between how Learners Described their Transformative Experiences and the Contributions of Global Education to those Experiences

Participant 'C' agreed that he has experienced transformation under the global education system in England: Describing his experience, he said:

> "I have no doubt that people would be transformed by global education. I have no doubt that people in the global education; especially in western universities will always be transformed whenever they are willing to learn about it. Some people in other countries or other continents live differently but because of the awareness which global education in Europe (I mean the teaching of global issues in European universities) creates in learners, transformation is sure to occur in learners lives. In fact, transformation occurs in learners lives. I can support this from my personal experience. My

transformation towards sustainable living started with what I was told on the orientation day... Lecturers also, sometimes in their teaching courses or modules, teach about sustainability. It also comes in as a course in the university or optional course for people to choose. In these ways, people are made aware of living a sustainable lifestyle".

Participant 'A' described his experience by looking at the future implications of not managing the environment sustainably. He said:

"As long as you are not managing environment with care, you are creating problem for the future, and posterity will not forgive you. So, in that case, it is important that we live sustainably even if we think that it is not our concern now, but we should be conscious that there are people we are going to live behind and we should not create problems for them. That is what I feel. We shouldn't create problems for future generations. So, as much as possible, we should imbibe the culture of living sustainably so that we do not create problems in the future".

# Chapter Six

# Discussion of Findings

## 6.1 Introduction

The central objective of this study was to find out whether international students undergo transformation towards sustainable living under global education approach to teaching and learning. In the test of the hypothesis to find out the relationship between global education and transformation of learners, it was found that global education transforms students to live a sustainable lifestyle. This implies that what students learn under global education has significant correlations with their change of attitudes towards sustainable living. The result obtained from the test of the key hypothesis thus provided the answer to the research objectives. In this chapter, findings are discussed under four subheadings: transformation towards sustainable living; relationships between what learners learn and sustainable living; learners' transformative experiences; and role of global education in the transformation process.

## 6.2 Transformation towards Sustainable Living

In the testing of the relationship between Global Education and transformation of learners towards sustainable living, findings from the analysis of both the quantitative and qualitative data showed that international students exposed to global education experienced transformation towards sustainable living. Results obtained from the data analysis indicated that students experienced transformation with regard to caring for the environment. This finding with regard to the quantitative data was anchored on the P-Value = 0.051 at 95% degree of freedom obtained in the test of the proposition: does global education transform learners to live sustainably? The finding from the quantitative interview agreed with the responses of the participants that took part in the qualitative interview. The general opinion expressed by the research participants was that they experienced transformation towards sustainable living. A student of molecular and cellular pathology, for example, said, "I am really transformed. Originally, I was aware but now, my awareness has increased from awareness to transformation. I can say that I am really informed and transformed".

Again, it was found that transformative experience occurred mostly in the students from Africa, Caribbean and Asian countries. These categories of students were found to have not been much exposed to the knowledge of environmental sustainability before their coming to Anglia Ruskin University. Results from both the quantitative and qualitative analysis showed that students experienced transformation towards sustainable living as a result of the education they received from British university. The *P-value* 0.000 which is less than 0.0005 (p < 0.0005) with a mean value of -1.733 and standard deviation of 0.924 obtained in the test of the relationship between the powers of global education to transform learners to live sustainably indicate that there is statistically significant association between global education and transformation of learners toward sustainable living. This result was corroborated by the views obtained from research participants in the qualitative interview. A participant in the qualitative interview said, *"I have experienced a lot of changes in the five years I have been in this school. Yes, you know in Africa where I come from, we care less about sustainability. Yes, to be honest I have been transformed".* This learner was aware that transformation has taken place in his pattern of living. Many others also confirmed that transformation has taken place in their lives. This agreed with the findings of Henderson (2002) that people who experience transformative learning are aware of doing so, and others can also see that transformation has taken place in those people.

However, there were some noticeable differences in the experience of transformation between students from Africa and those from China and India. Students from Africa were observed to have experienced greater transformation towards sustainable living than their counterparts from China and India. This finding was supported by the result of the test on the relationship between race and transformation of learners towards sustainable living. In the analysis of the results, it was found that the test value (t) is -29.305 and the *P-value* is 0.000 with a mean value of -1.941 and standard deviation of 1.274. Since the *P-value* is less than 0.0005 (p < 0.0005), it indicates that students from different races experience transformation towards sustainable living at different degrees or extent. Also, the three paired test of global education has transformative power showed a *P-value* less than 0.0005 (p < 0.0005) indicating that global education transforms learners toward sustainable living.

The reason for the differences in the transformative experience of students from different countries could be because there are differences in the level of awareness about sustainability in different countries. China, for example, is among the emerging economies of the world.

Because China attracts a lot of foreign direct investments (FDI), there is the possibility of the country craving for more sustainable business practices. This could lead to creating greater awareness about sustainability among the citizens. Thus, students from countries like China are likely to have more experience of what sustainable living is all about. This finding is supported by the findings from Fang, Cote and Qin (2007) that China has in recent years engaged in several sustainability initiatives at local and regional levels. In the case of Nigeria, participants from Nigeria said that global education has transformed their pattern of living. For example, participant C said, "In the place I work, there are industrial wastes. You cannot just throw it anywhere you like". This, he said is not a common practice in Nigeria. But the participants from China argued that they live sustainably back home. However, participants from China agreed that they have learnt additional ways of living sustainably as a result of the education they received from Anglia Ruskin University.

## 6.3 Relationships between what learners learn and sustainable Living

Testing of the relationship between what learners under Global Education learn and sustainable living indicated that there were significant relationships between what students learn under global education and their development of sustainable lifestyle. A student from China, an Asian country said during the interview that there are some small things that matter which he has learnt at Anglia Ruskin University about caring for the environment. This finding confirms that "global and environmental educators have developed curricula, teaching materials, and learning activities built upon the concepts of interconnectedness, interdependence, and interrelationship" (Selby 2004, p.25) between what learners learn at university and the development of sustainable way of living. The development of interconnectedness and learning activities as well as curricula that have elements of sustainability was confirmed by research participants. For instance, a student of Molecular and Cellular Pathology confirmed in an interview that his course contains elements of sustainability. In the test of association or relationship between course contents and transformation of students towards sustainable living, the mean value was 50.4 which indicated that global education provides learners with course contents that help to transform them towards sustainable living. This finding agreed with the results obtained from the study by Selby (1999; 2004) and Bliss (2010) which showed that learners experience transformation towards sustainable living under global education system.

However, it was also found that some courses have nothing for students to learn about sustainability. Such courses did not help to transform student to live sustainably. One of such courses noted by a participant in the study was English Language. He pointed out that language related courses do not have elements of sustainability in them. He said. "You know my course is language. All I have learnt is about English Language. But I suggest in my opinion it is important to put something about sustainability or protecting the environment in the course module for us". This statement demonstrated the need for reorientation of institutions of learning to embrace sustainability education at interdisciplinary level. In support of this finding, Pappas (2013) suggested that there is need for university to develop value-based sustainability content for classes across disciplines.

Even in the Business schools, it is argued that enough attention is not being paid to the teaching of good business practices or sustainability. Sometime, no attention at all is paid to sustainability education and as a result, education in Business Schools does not prepare students adequately to live sustainably. Buttressing this view, Participant 'B' in this study, a student in the Business School said that all through his Master's Degree programme and PhD in the UK, nobody ever taught him about sustainability in the courses he did even though he was a business student. This claims by participant 'B' agreed with the view by Waddock (2007 as cited in Stubbs, 2013, p.25) that "Business management curricula are not adequately preparing students to deal with sustainability issues". This implies that the business system we have designed a century or some years ago no longer serves the world, and educational curriculum lags even further behind corporate identity (Waddock, 2007; Benn and Dunphy, 2009). Thus, there is need for an acceptable approach to be used in introducing sustainability into university education curriculum. In this regard, Benn and Dunphy (2009) suggested participative approach instead of directive approach.

## 6.4 Learners Descriptions of their transformative Experiences

The test of relationship between how learners described their transformative experiences and the contributions of Global Education to those experiences showed that learners have different experiences of transformation towards sustainable living. First, it was found that students from the United Kingdom did not experience significant level of transformation towards sustainable living. Evidence from the study indicated that the university has added

little or nothing new to what the students from UK know about sustainable living. The following responses from the participants from Britain showed that Global Education has not helped to make them live more sustainably than what they learnt from their parents before coming to the university: "I don't see anything the university is doing to make me live sustainably. I learnt about sorting of wastes for recycling purpose from my dad". This finding agreed with the view of Hopkins and McKeowen (2002) that we cannot expect formal education system, which in reality touches only a fraction of learners' lives, to teach people everything about living, working, and governing in a manner that will achieve sustainability for their community and nation.

It was also found that making students to develop sustainable living style does not depend completely on the introduction of sustainability education at university. Participants in the study were of the view that it is the method of teaching students about sustainability that will lead to transformation of learners towards sustainable living. Some participants in the study noted that the nature of teaching about sustainability in the university only encourages students to read the course for the purpose of passing examination. Course delivery was not presented artistically to make students appreciate the content and apply what is learnt in real life situations. This finding agreed with Pugh (2011) explanation that students should be taught to put into use school content in a context (particularly out of school contexts) where application is not needed. Participants noted that if students are not taught in the way that they will see the needs to apply the course contents in real life situation, sustainability education cannot be transformative. A participant emphasised the need for making students to develop passion for sustainability by making teaching go beyond mere transmission of knowledge from the expert to the learners. He said: "Lecturers should teach the students in the way that could lead them to develop passion for sustainability. In fact, they should encourage students to first of all know the danger that the life we live today is causing to the environment, and the need to protect the future environment". Test of association between the skills and knowledge students acquire from university and their transformation towards sustainable living showed that at 95% confidence interval, Test value (t) was -5.033 and the *P-value* was 0.000 with a mean value of -0.341 and standard deviation of 1.302. Since the *P-value* is less than 0.0005 (p < 0.0005) it shows that there is statistically significant relationship between what students learn and their transformation towards sustainable living. This corroborates the finding that students are transformed by what they learn at university.

Although global education was found to be transforming students towards sustainable living, participants in the study were of the view that university needs a better way of teaching sustainability in order to make it transformative. This finding suggests that participants envisaged that university should be able to teach students in the way that can modify their behaviour to live sustainably. The finding agreed with the works of Daloz (1990); Glisczinski (2007); Chalkley (2006); Franz Furedi cited in Wegimont (2013) which found that university possesses the capacity to enhance the transformation of learners through making learners develop multiple perspectives, encouraging dialogue and construction of knowledge, and critically examine the norms within their environment. Where these objectives have not been completely achieved as was found in this study, the implication is that a new model for the teaching and learning about sustainability in the university could be necessary. Making a case in favour of developing a new model for teaching sustainability, Stubbs (2011) stated that in the Aspen Institute Centre for Business Education (2008) which publishes the *Beyond Grey Pinstripes* rankings of business schools that are integrating issues of social and environmental stewardship into curricula and research, it was found that 66 percent of students graduating from an MBA programme consider maximizing shareholder value as a major responsibility of business, while only 11 percent felt that enhancing environmental conditions is a primary responsibility. This shows that in most business courses, students are exposed primarily to the dominant business model and are not encouraged to critique it (Stubbs, 2011).

In addition, it was found that not all students are transformed completely to live sustainably under the global education system. Test of association between global education and complete transformation of learners showed a positive value of 0.047 and a P-value of 0.363 (36.3%). This result indicates the strength of association between the two variables is very weak with the probability of 36.3% in every 370 population sample. Since P-value is greater than 0.05, it follows that not all students are transformed completely towards sustainable living.

The study also found that transformation of learners towards sustainable living occurred in social organisations organised by educators to support students learning experiences. A member of one of such sustainability groups confirmed in an interview that he experienced his transformation towards sustainable living as a result of the discussions he engaged in as a member of sustainability and leadership organisation in the university. In his word, he said, "I have become part of some organisations in the university. These

organisations are active agents for caring for the environment". This has also impacted on the way I now look at the environment. This finding agreed with the finding from Donaldson (2009) that transformation occurred in social organisations organised by educators to support the learning of their students.

## 6.5 Global Education Role in the transformation of learners towards sustainable living

The specific roles global education plays in the transformation of learners towards sustainable living were identified by research participants. The study found that global education prepares learners to think of living their lives in the way that can ensure a sustainable future. Learners reflect on their past ways of living and project into creating a future in which both they and their children will be happy. Participant B, for example, stated, "I have the vision that I am thinking about the next generation. I have a son. I want him to live in a freer environment than where I am living now... These are the things that will help me not to lose the level of awareness I have acquired". A freer environment in this context is an environment that is sustainable: free from pollution, flooding, desertification, deforestation, and all sorts of environmental degradations. Selby (1999) study supported this finding when he argued that through working toward the realisation of an ideal future, through intellectual and sensorial engagement in the present and by developing our capacity and skills to help us serve as change agents, we can become transforming learners (Selby, 1999). The change in the attitudes of participants A and B in favour of sustainable ways of living was supported by the findings from paired sample test for learning leads to a change in the attitudes and acquisition of the knowledge skills students need to live sustainably (see table 5.25). As the paired sample test showed, at 95% confidence interval, the test value (t) is 3.995 and the P-Value is 0.000, with a mean value of 0.228 and Std. D of 1.095. Since the P-value is less than 0.0005 (P < 0.0005), it shows that there is statistically significant relationship between what students learn under global education and their transformation towards sustainable living.

It was also found that global education created awareness in learners. The teaching and learning that takes place under global education was found to have made students conscious of the need for living their lives the way that can help create a sustainable environment. The influence of Global Education made students to become aware of what they did not know before about sustainable environment. However, this awareness was more noticeable among

international students, especially those from Africa and some less developed countries of Asia. For example, Participant C Said, "I am now aware that I need not to throw anything into the river knowing fully well that such actions could endanger aquatic lives such as fish in water and ducks that float in the river. I am now aware that such activities could be hazardous to nature". This transformative experience as noted by O'Sullivan 2002, cited in D'Amato and Krasny (2011) led learners to gain new perspective as they address the disconnect between construct and experience that occurs when new constructs are discovered that make the novel and confusing perception intelligible and undergo transformation that results in learning of new values. Participants A made it clear that global education has made him to see the gains of living a sustainable lifestyle. He said "because I have seen the gains, and I have seen the changes, and you know, because we were not aware of these things in the past, and now I am aware of them, I take step forward". This finding agreed with Friere (1970 as cited in Fullerton, 2010, p.25) that educational encounter lead to conscientization which takes place when learners not as recipient but a knowing subjects, achieve a deepening awareness both of the socio-cultural reality which shapes their lives and their ability to transform that reality.

Furthermore, global education was found to not only be making learners aware of sustainability issues and transforming them to live sustainably but it also prepares them to become agents of change. All the participants that took part in the more in-depth qualitative interview said that they will not keep what they learnt about environmental sustainability to themselves. They expressed readiness to carry the campaign for sustainable living back to their various countries. The following excerpts from participant 'B' buttressed this finding: "I am planning to go back to my country and start up organisations that will be responsible for sensitising people on issues of environmental sustainability…" This student belonged to sustainability organisations in the university and was influenced by the activities of the organisations and the dialogues he engaged in within the organisations. Hence, this finding agreed with the findings of some social learning theorist such as Albert Bandura who said that attitudes and behaviours are learned through human interactions with the social world in which we live (Aziz *et al.* 2012).

Also, the study found that students from developing countries were not very much aware of sustainability before coming to the United Kingdom for studying. Many of the research

participants from Africa never knew about nor heard anything about sustainability in their home universities. Excerpt from the participants in this study provided evidence that led to this finding. For example, a research participant from Africa said:

> "Well, in honest, there was little or no education, knowledge of preserving the environment. Our way of life in Nigeria is such that government and the people do not necessarily care about preserving the environment or sustaining it for future generations…" (Excerpt from Participant C).

Another participant from Africa said:

> "Well, before I came to Anglia Ruskin University to study, in terms of environment, I was not conscious of environment. I say this because I did not have prior learning or sensitisation on the risks involved in living a certain kind of lifestyle which does not support the environment and caring for the future generation" (Excerpt from Participant B).

The implication of their statements is that much is not taught about sustainability in African countries. Supporting this finding, study carried out in some African Universities showed that with regard to campus greening, very little was happening in the area of energy conservation, waste reduction or recycling, water conservation or sustainable landscaping (Mohamedbhai, 2012). They were however some few students from Africa and developing countries of Asia that said they had knowledge of environmental sustainability before their sojourn to England. Yet, they still experience some level of transformation towards sustainable living under global education. On the other hand, students from England and other European countries were found to have good knowledge of what it means to live sustainable lifestyle. Majority of them were equally found to be practicing sustainable living. A participant from England said:

> For me, I have learnt something about my course. Looking at the environment, I can't say the university is doing anything about the environment apart from the course they provide that relate to environmental sustainability and the activities they engage in…" (Excerpt from Participant E).

The way sustainability issues are taught in university was found to be inadequate for transforming learners towards sustainable living. Opinions from both the qualitative and quantitative data sources agreed that university needs to find a better way of teaching sustainability. The result obtained from chi-square test for university needs better way of teaching sustainability was .921 (see table 36 in Appendix 1). It can be inferred from this that the result of the two-sided chi-square test was above 0.05. This suggests that university needs a better way of teaching about sustainability. This finding was corroborated by the statement from B. He said, "I did not gain anything about sustainability because of the teaching or how they have been teaching me about these things. Nobody ever taught me about sustainability in

the course I did…" He suggested that "Lecturers should teach the students in the way that could lead them to develop passion for sustainability. In fact, they should encourage students to first of all know the danger the life we are living today is causing to the environment…" This finding is in line with Moore (2005) suggestion that educators should find a way to practice the ideals of sustainability within our classroom that teachers and learners can gain experience of what sustainability is in practice. This suggestion implied that the approach to the teaching of sustainability is more theoretical than practical. It could be said that the emphasis on academic content in the teaching of sustainability is robbing learners the opportunity of learning to practice sustainable behaviours. Moore (2005) agreed with this view and suggested that by changing the practice in classroom, it is possible for transformation to occur for individuals, organisations and systems. In this regard, Mann *et al* (2013) suggested teaching in the affective domain.

# Chapter Seven

# Contributions to knowledge, Conclusions and Recommendations

## 7.1 Introduction

In this chapter, contributions to knowledge, the conceptual conclusions to the study and recommendations are presented. The recommendations are made to university, students and policy makers on how global education can be used to enhance the transformation of learners towards sustainable living. Finally, suggestions are made on how these recommendations could be achieved.

### 7.1.1 Theoretical contributions

In the theoretical contributions, this study contributes to the conceptual understanding of the relationship between global education, transformative learning and sustainability. As sustainability education is becoming an important aspect of education at university, the exploration of literature on how global education and transformative learning can help in promoting ecological literacy and social change contributes to human understanding of the need for developing high sense of sustainable behaviours. The study established the implications of human relationship with the ecology that support life. It also added to the existing literature in the area of sustainability. The unique contribution to knowledge in this area rests in the way the study made connections between anthropogenic factors that cause sustainability crisis and the role of global education in the transformation of learners towards sustainable living. The study established the actual impacts of global education on the attitudes and behaviours of learners in relation to the environment. It did this by providing evidence that showed Global Education is transformative. Thus, a holistic understanding of the relationships that exists between global education, transformative learning and sustainability was established by this study.

Again, findings from this study showed that university students undergo transformation towards sustainable living. This study added to knowledge by providing empirical evidence that showed that students from developing countries of the world experience more transformation under Global Education than their counterpart from the developed countries.

This area of research has been understudied by scholars, thus making scholars conclude that university education system in the 21$^{st}$ century remains mechanistic. While this study does not rule out the probability that knowledge is still passed from expert to learners in transmissive form, it has successfully established that there are some elements of transformative learning in the system. This evidence is supported by the mean value of 107.05 of the 370 sample population at 95% degree of freedom. This result was corroborated by the results obtained from qualitative interview of 10 students at university.

In addition, by filling the gaps upon which the research topic was identified and studied, this study has made contribution to knowledge. It has narrowed down the margin of research in this area and pushed further what scholars need to investigate in the field of transformation towards sustainable living under global education field. This means that future studies in this area need to find new gaps to fill in order to make further contributions to knowledge. In this way, the frontier of knowledge will continue to expand. In filling the gaps that exist in literature, it was noted that global education produces graduates who become managers of companies. This means that managers and employees of organisations educated under global education approach ought to know about and follow the principles of sustainability in the production of goods and rendering of services and in their daily living. This important aspect was touched upon by Kottler (2011) and Magala (2012) who discussed what some companies are doing to be seen as sustainable. However, both Kottler and Magala in their studies did not mention transformation in the attitudes and behaviours of learners, Chief Executives of Organisations (CEOs) and employees of companies as fundamental to achieving sustainability. This study filled this gap by investigating and finding out how learners who would be future company leaders could be transformed to do business sustainably. This was reflected in the overall discussions in this study and in the recommendations.

Furthermore, some studies on sustainability made useful suggestions that pointed to the fact that ethical living in addition to the triple bottom line approaches to sustainability could be result oriented ways of achieving sustainability. However, the inclusion of ethical living to the triple bottom line principle which this study sees as vital lacked any explanation of how it could help transform people to live ethically and invariably sustainably. Marshal and Toffel (2008) noted that the triple bottom line approach to addressing sustainability issues needs to be expanded to include other bottom lines such as ethical bottom line, but they did not explain how individuals and companies could be made to be ethical in their activities. In this

study, this gap was identified and filled by critically reviewing the contributions of global education approach in the transformation of learners towards sustainable living. This study sees the development of global education as an effective tool for making learners to behave, act and be ethically responsible in both their daily living and in the process of doing business. Global education was found to be causing a shift in the mechanistic and materialistic ways of thinking that characterised the education system in the past to a more holistic and sustainable world view.

Equally, most of the studies that investigated the role of university in the creation of a sustainable society (e.g. Akel, 2006; Beringer, 2007) did not investigate or say anything on the outcome of education for sustainable development. They also left out the impact of global education on the ways students behave and act towards the environment. This present study provided empirical evidences that showed how students behave towards the environment.

Also, this study explored how transformation takes place in the life of an individual when the individual is challenged by experiences of the past and an understanding of the socio-economic reality of the present to make a shift from the former way of living to a new way that is more sustainable than the previous lifestyle. By examining the transformative processes which learners undergo when they are exposed to issues of global importance, the need to live a sustainable lifestyle, and by making findings with regard to the transformation that takes place towards sustainable living under the global education field, this study makes contribution to knowledge that could help universities to prepare students to live sustainably and help in the building of a sustainable society.

In addition, this study has linked three important constructs in the way that could help enhance sustainability. These constructs are global education, transformative learning and sustainable living. While there are many studies that examined each of these areas as a separate area, only few studies delved into the examination of the relationship between sustainability, transformative learning and global education. By filling this gap, this study has reduced the dearth of scholarly literature on the relationships between global education, transformative learning and sustainability.

## 7.1.2 Practical contribution

The study produced a simple model of teaching and learning about sustainability at university. This model makes the university the bridge between learners and the development of sustainable behaviours and attitudes. In the model, the university has three arms: one linking the university and learners and another linking the university and ecology; and the third arm connects learners and ecology. This model is expected to produce learners with transformed lifestyle that could make them live sustainably.
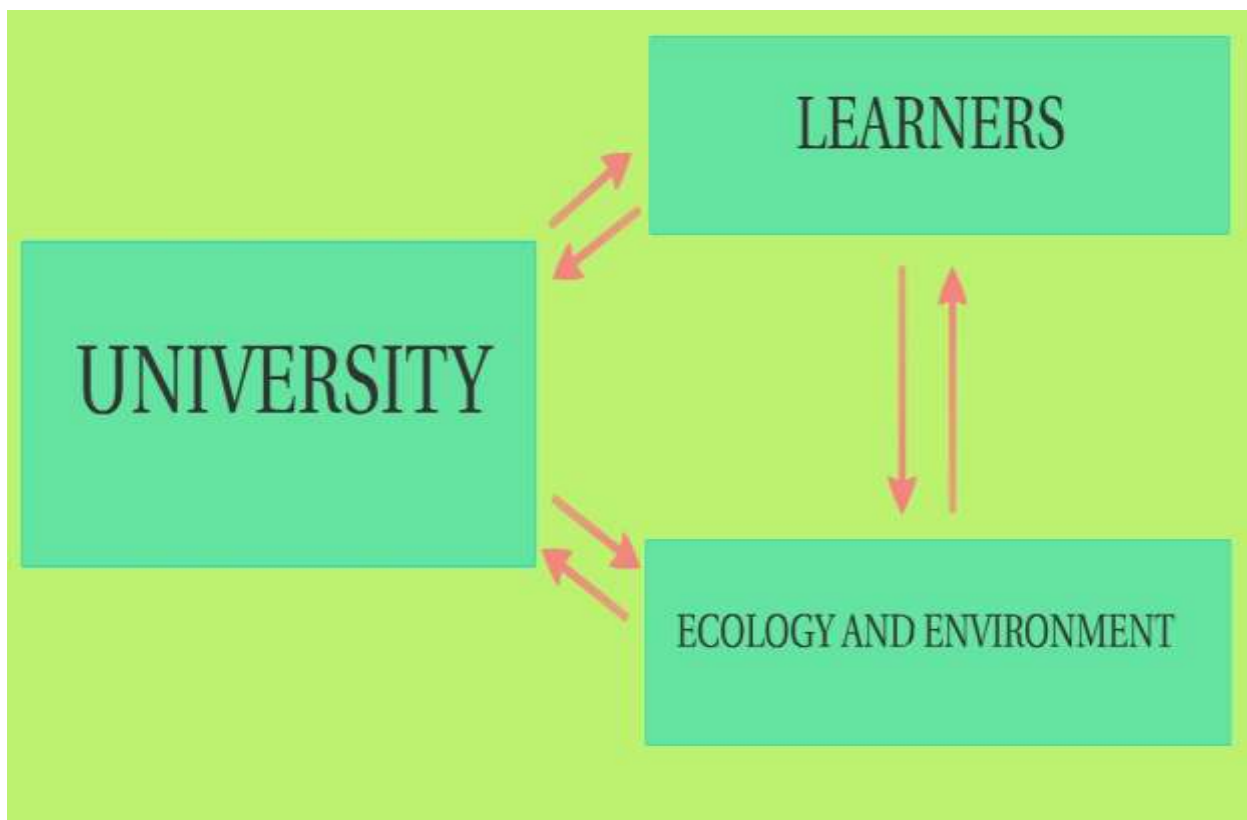


**Figure 7.1:** A simple model for teaching and learning about ecology and environment (**Author's Source**, 2014)

As the model shows, the teaching of sustainability involves an interaction between three components, a kind of tripartite relationship. These are the university made up of principal actors such as the university head, the lecturers and other staff member; the students; ecology/environment. The lecturers act as the agent of change. Through the art of teaching which includes the approaches and objectives, lecturers in the university could provide

learners with transformative ecological and environmental education. Learners or students have to learn what lecturers teach them about ecology and sustainability and use what they learn to influence others towards sustainable living. The model explains that there must be interdependent and interactive relationships between the university, learners and ecology/environment. The model does not indicate any particular discipline but refers to all learners in the university. Thus, it suggests that the teaching and learning about sustainability must be interdisciplinary.

## 7.2 Conclusions

The integration of global education, transformative learning and sustainability is central to producing a generation of learners that are conscious about creating a sustainable environment. Global education could bring about learning to live sustainably through approaches to teaching and learning, and the engagement of learners in the discussion of global issues. Because sustainability issue is a global problem, addressing it needs to involve people from all parts of the world. This study explored the opportunity provided by global education for the discussion of global issues to find out how the approach has been impacting on learners with respect to sustainable living. In doing so, it used a conceptual framework that linked global education, transformative learning and sustainability.

Sustainability is a complex term which defies a single definition. A consensus on what it means, and how to deal with the issue has not been reached. It complexity rests not only in the difficulty scholars experience in the attempts to define the concept but also because of its dynamic nature. In other words, sustainability is a concept that has continued to evolve in meaning. The argument about the reality of climate change is ongoing and climate change sceptics seem to be maintaining their stance. However, what is becoming clearer is that there is global warming and human activities contribute to this. The consequences of anthropogenic climate change are environmental degradation, flooding, desertification, pollution, impairment of human health and the endangerment of biodiversity. These issues call for humanity to redefine their way of relating with the planet so as to reduce our impacts on the environment and invariably reduce sustainability crisis. In bringing about the required change in attitudes to reduce sustainability crisis, global education approach to teaching and learning has been attested to be vital for enhancing transformative learning. Findings from the study indicated that global education transforms learners towards sustainable living. The

levels of transformation students undergo vary from culture to culture. It can be concluded that the objectives of this study were achieved. This is because the study provided answers to the research questions and hypotheses that were used to investigate the transformation of learners towards sustainable living under global education system.

# 7.3 Recommendations

## 7.3.1 For University

The university occupies a central position in the training of young people who could become future leaders and policy makers. Therefore, efforts made towards transforming students are efforts toward building a sustainable future. The university needs to produce graduates that are not only sustainability conscious but also advocates of sustainable living. There are several ways the university can achieve this goal:

a) The introduction of a well-articulated sustainability curriculum in all universities could help build theoretical and practical knowledge of sustainable living in learners. Teaching and learning based on such curriculum should cut across discipline. The problem with previous arrangement which seems to have failed in having impact in all students was that some universities that have courses on sustainability limited such courses to few faculties and departments. In most of the universities that are acknowledged to be pace setters in sustainability initiatives, the teaching and learning in such programme are most of the time concentrated in the Business School. Thus, only the students that are lucky to find themselves in the Business School are exposed to the knowledge of sustainability. Even at that, the course is usually too academic, aimed at making the learners to be expert in sustainability management. This approach makes students to concentrate in reading to pass examination and qualify for the award of a degree. This is of little significance when it comes to practice. What should be done is to teach the students with a view to making them sustainability conscious. Students who want to be experts in the area can go ahead after the level of general knowledge to specialise in it. But first and foremost, every student should be made to do one course that contains element of sustainability. The examination in this course should be made simple but with the principles of sustainability well-articulated in the teaching, learning and examination. This will encourage every student to be part of the movement.

b). Also, more teachers need to be trained in the area of sustainability. University can encourage more teachers to do a short course on sustainability by offering incentives. Such incentives could include immediate promotion on completion of the course, an enhanced course allowance, university paid publication for any article from either a student or a lecturer on any issue that is relevant to transformation towards sustainable living. This should involve all faculties in the university.

c). Universities engaged in global education should put students from different races in the same accommodation. If universities put students from different races in the same accommodation, those from countries where sustainable living is practiced can influence those from countries where there is low sense of sustainability. That is, the behaviour of the students that are sustainability conscious can influence the others. In this way, people can learn how to protect the environment, save energy, and other ways of living sustainably.

d). Also, universities should organising seminars and conferences on sustainable planet. In addition, universities can set aside one day in a year that is to be celebrated as 'Sustainability Day'. If this is done for some years, it will become a reminder in our daily lives that we need to live sustainably. Sustainability Day can feature different activities that promote sustainable living. Everything must not all be about watching the opening ceremony of Olympic Game, world cup or celebrating one religious festival or the other. The survival of our planet is as important as any of these issues, if not more important.

e). Also, more societies that discuss issues of sustainability should be introduced in universities. Sustainability societies provide an avenue for students to meet and discuss issues of sustainability. Evidence available shows that students who are members of sustainability societies are not only more conscious of living sustainably but also act as agents of change in the community.

## 7.3.2 For Individuals

The activities of individuals contribute largely to sustainability issues. The way individuals use resources needs to be sustainable. Our pattern of consumption needs to be regulated. Equally, human activities such as deforestation, bush burning, improper waste disposals, and the way we make use of the soil can all lead to sustainability crisis. For example, the way individuals use farm land for agriculture can lead to depletion of soil fertility. Deforestation

can lead to desertification. These activities reduce biodiversity that help to sustain life on the planet. Thus, we have to be more careful in the way we use resources.

### 7.3.3 For Policy makers

Intensification of awareness campaign is necessary to foster sustainable living. Awareness campaign on control of greenhouse gas emissions should be intensified. Government should channel their strengths towards this area. It is important that people should be made to understand that human activities contribute to sustainability crisis.People should be made to understand that we can reduce the impacts of climate change on human lives and the biosphere by changing our attitudes towards the environment.  Creating of public awareness that can be effective can be achieved in several ways. Government could use the mass media, social media networks like Facebook, Linkedin, Flickr, Twitter,  Youtube, blogs, wikis, Second Life, MySpace,, video sharing, e-mails, instant messaging Retting and so on to carry the campaign to all nooks and crannies.  These communication media can be used to create shock factors to make people realise the damage they are doing to the environment. Documentaries and videos with trees and gardens damaged, for example, and their effects on the environment could be shown on televisions at intervals and posted on social media to serve as reminder to people of the effects of unsustainable human activities on the environment.

Legislation can also be used to encourage companies to help in creating the needed awareness about sustainability. It can be made a condition in marketing that any manufactured products should carry an advert on sustainability. Since everybody in the universe is a consumer, it could be a good strategy to have one or two clauses about sustainability on every product that is manufactured anywhere in the world. This will make not only the individual consumers of the products to be aware of the needs for living sustainably but also the manufacturing companies, some of who are the major contributors to the problem to become agent of change themselves. On the other hand, if consumers could make sure that every product they buy and use is eco-friendly or carries eco-campaign, such patronage will encourage producers to produce such products.

### 7.3.4 For Organisations

Business organisations need to act sustainably. This study recommends that organisations should be part of the global movement for creating a sustainable society. In order to take

active part in negotiating the path to sustainability, it is important that organisations should do business in sustainable and ethical manners. The drive for profit and growth should be balanced with the need to pursue sustainability (Kottler, 2011). As suggested by Kottler (2011) companies must balance more carefully their growth goals with the need to bring about sustainability. The best way to do this should be for companies to think less of making all the profits they need for shareholders without concern for the environment, resource conservation and the future of the next generations. Organisations should work towards transforming their employees to act and live sustainably.

## 7.3.5 For Further Studies

The stated objectives of this study were adequately achieved. First, the study was able to find out that global education is transformative. Findings from this study showed that under the Global Education field, students experience transformation towards sustainable living. In this experience, the pedagogy of teaching did not contribute much but course contents, the associations that students belong to and the orientations provided by university largely contributed to the transformation of learners towards sustainable living. Equally, this study proposed to make recommendations based on the findings from the study. This objective was achieved by making useful recommendations on how to create a sustainable society. It also suggested implementation strategies to various impact groups.

However, this study was not able to investigate how students that were exposed to global education implemented their experiences when they left university. It is important to investigate this area because implementation is what changes the state of things in the world. A follow up study is therefore recommended in order to find out whether the transformation of learners towards sustainable living is irreversible as some of the research participants in this study claimed. This follow up study will be better carried out in the developing countries of Africa and Asia where many of the students that participated in this study came from.

Also, because sustainability is a very dynamic concept, the data generated in this study might not be valid for so long. Therefore, in any further study in this area, it is suggested that it might be important to compare the claims of this study with the changes that might have taken place some years after this study was carried out. Thus, I suggests that further studies

should be done in this area, especially a confirmation study to complement what has been achieved in this study.

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## Appendix 1: Tables

### Table 1: Summary of demographic data

| Descriptive Statistics | | | | | | | |
|---|---|---|---|---|---|---|---|
| | N | Range | Minimum | Maximum | Mean | Std. Deviation | Variance |
| Gender | 370 | 1 | 1 | 2 | 1.48 | 0.5 | 0.25 |
| Age range | 370 | 5 | 1 | 6 | 1.31 | 0.707 | 0.5 |
| Race | 370 | 2 | 1 | 3 | 1.95 | 0.817 | 0.667 |
| Educational Level | 370 | 2 | 1 | 3 | 1.99 | 0.127 | 0.016 |
| Valid N (listwise) | 370 | | | | | | |

Table 1 shows the summary of the descriptive statistics that represented the values of the demographic variables: respondents' gender, age, race and educational levels

### Table 2: Chi-square Tests for gender in the different age groups

| Chi-Square Tests | | | |
|---|---|---|---|
| | Value | df | Asymp. Sig. (2-sided) |
| Pearson Chi-Square | 10.294[a] | 5 | 0.067 |
| Likelihood Ratio | 10.938 | 5 | 0.053 |
| Linear-by-Linear Association | 6.83 | 1 | 0.009 |
| N of Valid Cases | 370 | | |

**6 cells (50.0%) have expected count less than 5. The minimum expected count is .48**

Table 2 shows the chi-square results for gender in the different age groups of respondents.

### Table 3: Pearson's R and Spearman correlation for Gender

| Symmetric Measures | | | | | |
|---|---|---|---|---|---|
| | | Value | Asymp. Std. Error[a] | Approx. T[b] | Approx. Sig. |
| Interval by Interval | Pearson's R | -0.136 | 0.05 | -2.634 | .009[c] |
| Ordinal by Ordinal | Spearman Correlation | -0.159 | 0.05 | -3.093 | .002[c] |
| N of Valid Cases | | 370 | | | |

Table 3 showed the Pearson's and Spearman Correlation values for the demographic variables: the distribution of gender in the different age groups.

**Table 4: Chi-square Tests**

| Chi-Square Tests | | | |
|---|---|---|---|
| | Value | df | Asymp. Sig. (2-sided) |
| Pearson Chi-Square | 3.855[a] | 4 | 0.426 |
| Likelihood Ratio | 3.859 | 4 | 0.425 |
| Linear-by-Linear Association | 0.168 | 1 | 0.682 |
| N of Valid Cases | 370 | | |

**Table 5: Symmetric Measures for educational level and race**

| Symmetric Measures | | Value | Asymp. Std. Error[a] | Approx. T[b] | Approx. Sig. |
|---|---|---|---|---|---|
| Interval by Interval | Pearson's R | 0.021 | 0.045 | 0.409 | .683[c] |
| Ordinal by Ordinal | Spearman Correlation | 0.02 | 0.045 | 0.375 | .708[c] |
| N of Valid Cases | | 370 | | | |

**Table 6: Chi-square tests for educational level and age of respondents**

| Chi-Square Tests | | | |
|---|---|---|---|
| | Value | df | Asymp. Sig. (2-sided) |
| Pearson Chi-Square | 13.783[a] | 10 | 0.183 |
| Likelihood Ratio | 4.882 | 10 | 0.899 |
| Linear-by-Linear Association | 2.592 | 1 | 0.107 |
| N of Valid Cases | 370 | | |

**Table 7 Symmetric measures for educational level and age of respondents**

| Symmetric Measures | | | | | |
|---|---|---|---|---|---|
| | | Value | Asymp. Std. Error[a] | Approx. T[b] | Approx. Sig. |
| Interval by Interval | Pearson's R | -0.084 | 0.079 | -1.613 | .108[c] |
| Ordinal by Ordinal | Spearman Correlation | -0.065 | 0.062 | -1.254 | .211[c] |
| N of Valid Cases | | 370 | | | |

**Table 8: Chi-square tests for gender and education level**

| Chi-Square Tests | | | |
|---|---|---|---|
| | Value | df | Asymp. Sig. (2-sided) |
| Pearson Chi-Square | 1.217[a] | 2 | 0.544 |
| Likelihood Ratio | 1.602 | 2 | 0.449 |
| Linear-by-Linear Association | 0.547 | 1 | 0.46 |
| N of Valid Cases | 370 | | |

**Table 8;** showed the chi-square value for education level and age range of respondents cross tabulation

**Table 9: Symmetric measures for gender and educational level**

| Symmetric Measures | | Value | Asymp. Std. Error[a] | Approx. T[b] | Approx. Sig. |
|---|---|---|---|---|---|
| Interval by Interval | Pearson's R | 0.039 | 0.05 | 0.739 | .460[c] |
| Ordinal by Ordinal | Spearman Correlation | 0.038 | 0.05 | 0.736 | .462[c] |
| N of Valid Cases | | 370 | | | |

Table 9 showed the values of Pearson's R and Spearman's correlations for educational level and age range cross tabulation.

**Table 10: Chi-square Test for educational level enhances sustainable living**

| Chi-Square Tests | Value | df | Asymp. Sig. (2-sided) |
|---|---|---|---|
| Pearson Chi-Square | 4.197[a] | 8 | 0.839 |
| Likelihood Ratio | 4.764 | 8 | 0.783 |
| Linear-by-Linear Association | 3.132 | 1 | 0.077 |
| N of Valid Cases | 370 | | |

**Table 11: Symmetric Measures for educational level enhances sustainable living**

| Symmetric Measures | | Value | Asymp. Std. Error[a] | Approx. T[b] | Approx. Sig. |
|---|---|---|---|---|---|
| Interval by Interval | Pearson's R | -0.092 | 0.036 | -1.775 | .077[c] |
| Ordinal by Ordinal | Spearman Correlation | -0.1 | 0.041 | -1.929 | .055[c] |
| N of Valid Cases | | 370 | | | |

**Table 12: Chi-square Tests for race of learner make education to enhance sustainability**

| Chi-Square Tests | | | |
|---|---|---|---|
| | Value | df | Asymp. Sig. (2-sided) |
| Pearson Chi-Square | 5.061[a] | 8 | 0.751 |
| Likelihood Ratio | 5.439 | 8 | 0.71 |
| Linear-by-Linear Association | 0.196 | 1 | 0.658 |
| N of Valid Cases | 370 | | |

**Table 13: Symmetric measures for race make education to enhance sustainability**

| Symmetric Measures | | | | | |
|---|---|---|---|---|---|
| | | Value | Asymp. Std. Error[a] | Approx. T[b] | Approx. Sig. |
| Interval by Interval | Pearson's R | -0.023 | 0.054 | -0.442 | .659[c] |
| Ordinal by Ordinal | Spearman Correlation | -0.03 | 0.052 | -0.575 | .566[c] |
| N of Valid Cases | | 370 | | | |

**Table 14: Chi-square Tests learning develop students to think sustainably**

| Chi-Square Tests | | | |
|---|---|---|---|
| | Value | df | Asymp. Sig. (2-sided) |
| Pearson Chi-Square | 8.269[a] | 8 | 0.408 |
| Likelihood Ratio | 8.351 | 8 | 0.4 |
| Linear-by-Linear Association | 2.015 | 1 | 0.156 |
| N of Valid Cases | 370 | | |

Table 14 showed the results of the chi-square test for learning develops students to think sustainably.

**Table 15: Symmetric measures for learning develops students to think sustainably**

| | | Value | Asymp. Std. Error[a] | Approx. T[b] | Approx. Sig. |
|---|---|---|---|---|---|
| | **Symmetric Measures** | | | | |
| Interval by Interval | Pearson's R | -0.074 | 0.052 | -1.421 | .156[c] |
| Ordinal by Ordinal | Spearman Correlation | -0.079 | 0.052 | -1.523 | .129[c] |
| N of Valid Cases | | 370 | | | |

**Table 16:  Educational Level * Learning develops students to think sustainably**

| Crosstab | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Learning develops students to think sustainably | | | | | Total |
| | | Strongly Disagree | Disagree | Undecided | Agree | Strongly Agree | |
| Educational Level | College | 0 | 1 | 0 | 3 | 1 | 5 |
| | University | 7 | 34 | 91 | 172 | 60 | 364 |
| | 3 | 0 | 0 | 1 | 0 | 0 | 1 |
| Total | | 7 | 35 | 92 | 175 | 61 | 370 |

**Table 17: Chi- square Tests for learning develops students to think sustainably**

| Chi-Square Tests | | | |
|---|---|---|---|
| | Value | df | Asymp. Sig. (2-sided) |
| Pearson Chi-Square | 5.165[a] | 8 | 0.74 |
| Likelihood Ratio | 6.105 | 8 | 0.636 |
| Linear-by-Linear Association | 0.341 | 1 | 0.559 |
| N of Valid Cases | 370 | | |

**Table 18: Symmetric Measures for learning develops students to think sustainably**

| Symmetric Measures | | Value | Asymp. Std. Error[a] | Approx. T[b] | Approx. Sig. |
|---|---|---|---|---|---|
| Interval by Interval | Pearson's R | -0.03 | 0.052 | -0.584 | .560[c] |
| Ordinal by Ordinal | Spearman Correlation | -0.043 | 0.051 | -0.819 | .414[c] |
| N of Valid Cases | | 370 | | | |

**Table 19: Chi-square Tests for students are transformed by course content based on race**

| Chi-Square Tests | Value | df | Asymp. Sig. (2-sided) |
|---|---|---|---|
| Pearson Chi-Square | 11.170[a] | 8 | 0.192 |
| Likelihood Ratio | 11.551 | 8 | 0.172 |
| Linear-by-Linear Association | 0.169 | 1 | 0.681 |
| N of Valid Cases | 370 | | |

**Table 20: Symmetric Measures for students transformed by course content based on race**

| Symmetric Measures | | Value | Asymp. Std. Error[a] | Approx. T[b] | Approx. Sig. |
|---|---|---|---|---|---|
| Interval by Interval | Pearson's R | -0.021 | 0.052 | -0.411 | .681[c] |
| Ordinal by Ordinal | Spearman Correlation | -0.008 | 0.052 | -0.146 | .884[c] |
| N of Valid Cases | | 370 | | | |

**Table 21: Gender * Students transformed by course contents**

| Crosstab | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Students transformed by course content | | | | | Total |
| | | Strongly Disagree | Disagree | Undecided | Agree | Strongly Agree | |
| Gender | Male | 4 | 26 | 41 | 90 | 33 | 194 |
| | Female | 3 | 25 | 50 | 75 | 23 | 176 |
| Total | | 7 | 51 | 91 | 165 | 56 | 370 |

**Table 22: Students transformed by course contents based on gender**

| Chi-Square Tests | | | |
|---|---|---|---|
| | Value | df | Asymp. Sig. (2-sided) |
| Pearson Chi-Square | 3.334[a] | 4 | 0.504 |
| Likelihood Ratio | 3.339 | 4 | 0.503 |
| Linear-by-Linear Association | 1.357 | 1 | 0.244 |
| N of Valid Cases | 370 | | |

**Table 23: Symmetric measures for students transformed by course contents based on gender**

| Symmetric Measures | | | | | |
|---|---|---|---|---|---|
| | | Value | Asymp. Std. Error[a] | Approx. T[b] | Approx. Sig. |
| Interval by Interval | Pearson's R | -0.061 | 0.052 | -1.165 | .245[c] |
| Ordinal by Ordinal | Spearman Correlation | -0.072 | 0.052 | -1.377 | .169[c] |
| N of Valid Cases | | 370 | | | |

**Table 24: Chi-square Tests for students education protects society and environment**

| Chi-Square Tests | Value | df | Asymp. Sig. (2-sided) |
|---|---|---|---|
| Pearson Chi-Square | 2.071[a] | 4 | 0.723 |
| Likelihood Ratio | 2.095 | 4 | 0.718 |
| Linear-by-Linear Association | 0.027 | 1 | 0.87 |
| N of Valid Cases | 370 | | |

**Table 25: Symmetric Measures for students education protects society and environment**

| Symmetric Measures | | Value | Asymp. Std. Error[a] | Approx. T[b] | Approx. Sig. |
|---|---|---|---|---|---|
| Interval by Interval | Pearson's R | -0.009 | 0.052 | -0.164 | .870[c] |
| Ordinal by Ordinal | Spearman Correlation | -0.021 | 0.052 | -0.407 | .684[c] |
| N of Valid Cases | | 370 | | | |

Table 43 showed the Pearson's R and Spearman's Correlation for student's education protects society and environment based on gender.

**Table 26: Age range of Respondent * Students Education protect society and environment**

| Crosstab | | Students Education protect society and environment | | | | | Total |
|---|---|---|---|---|---|---|---|
| | | Strongly Disagree | Disagree | Undecided | Agree | Strongly Agree | |
| Age range of Respondent | 16 - 24 | 10 | 48 | 48 | 130 | 54 | 290 |
| | 25 - 33 | 0 | 11 | 8 | 32 | 9 | 60 |
| | 34 - 42 | 1 | 4 | 0 | 3 | 4 | 12 |
| | 43 - 51 | 0 | 1 | 0 | 3 | 1 | 5 |
| | 52 - 60 | 0 | 0 | 0 | 0 | 1 | 1 |
| | 61 - Above | 1 | 0 | 1 | 0 | 0 | 2 |
| Total | | 12 | 64 | 57 | 168 | 69 | 370 |

**Table 27: Chi-square Tests for students education protects society and environment based on age**

| Chi-Square Tests | | | |
|---|---|---|---|
| | Value | df | Asymp. Sig. (2-sided) |
| Pearson Chi-Square | 33.106[a] | 20 | 0.033 |
| Likelihood Ratio | 27.231 | 20 | 0.129 |
| Linear-by-Linear Association | 0.269 | 1 | 0.604 |
| N of Valid Cases | 370 | | |

**Table 28: Symmetric Measures for education protects society and environment based on age**

| Symmetric Measures | | | | | |
|---|---|---|---|---|---|
| | | Value | Asymp. Std. Error[a] | Approx. T[b] | Approx. Sig. |
| Interval by Interval | Pearson's R | -0.027 | 0.066 | -0.518 | .605[c] |
| Ordinal by Ordinal | Spearman Correlation | 0.007 | 0.054 | 0.142 | .887[c] |
| N of Valid Cases | | 370 | | | |

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**Table 29 shows that frequency of gender in the different age ranges.**

| Gender * Age range of Respondent Cross-Tabulation | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Age range of Respondent | | | | | | Total |
| | | 16 - 24 | 25 - 33 | 34 - 42 | 43 - 51 | 52 - 60 | 61 - Above | |
| Gender | Male | 140 | 40 | 8 | 4 | 1 | 1 | 194 |
| | Female | 150 | 20 | 4 | 1 | 0 | 1 | 176 |
| Total | | 290 | 60 | 12 | 5 | 1 | 2 | 370 |

**Table 30: Gender * Students Education protects society and environment**

| | | Students Education protect society and environment | | | | | Total |
|---|---|---|---|---|---|---|---|
| | | **Strongly Disagree** | **Disagree** | **Undecided** | **Agree** | **Strongly Agree** | |
| Gender | **Male** | 8 | 33 | 27 | 87 | 39 | 194 |
| | **Female** | 4 | 31 | 30 | 81 | 30 | 176 |
| Total | | 12 | 64 | 57 | 168 | 69 | 370 |

**Table 31: Chi-square tests for transformation and sustainability need more explanations at university based on race of students**

| Chi-Square Tests | Value | df | Asymp. Sig. (2-sided) |
|---|---|---|---|
| Pearson Chi-Square | 8.527[a] | 8 | 0.384 |
| Likelihood Ratio | 9.513 | 8 | 0.301 |
| Linear-by-Linear Association | 0.126 | 1 | 0.722 |
| N of Valid Cases | 370 | | |

**Table 32: Symmetric measures for transformation and sustainability need more explanations at university based on race of students**

| Symmetric Measures | | Value | Asymp. Std. Error[a] | Approx. T[b] | Approx. Sig. |
|---|---|---|---|---|---|
| Interval by Interval | Pearson's R | 0.018 | 0.054 | 0.355 | .723[c] |
| Ordinal by Ordinal | Spearman Correlation | 0.003 | 0.053 | 0.054 | .957[c] |
| N of Valid Cases | | 370 | | | |

**Table 33: Chi-square tests for global education has transformative power**

| Chi-Square Tests | | | |
|---|---|---|---|
| | Value | df | Asymp. Sig. (2-sided) |
| Pearson Chi-Square | 4.649[a] | 8 | 0.794 |
| Likelihood Ratio | 5.017 | 8 | 0.756 |
| Linear-by-Linear Association | 0.452 | 1 | 0.501 |
| N of Valid Cases | 370 | | |

**Table 34: Symmetric measures for global education has transformative power**

| Symmetric Measures | | | | | |
|---|---|---|---|---|---|
| | | Value | Asymp. Std. Error[a] | Approx. T[b] | Approx. Sig. |
| Interval by Interval | Pearson's R | 0.035 | 0.054 | 0.672 | .502[c] |
| Ordinal by Ordinal | Spearman Correlation | 0.048 | 0.053 | 0.923 | .357[c] |
| N of Valid Cases | | 370 | | | |

**Table 35:  Gender * University needs better way of teaching sustainability**

| Crosstab | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | University needs better way of teaching sustainability | | | | | Total |
| | | Strongly Disagree | Disagree | Undecided | Agree | Strongly Agree | |
| Gender | Male | 2 | 5 | 23 | 86 | 78 | 194 |
| | Female | 1 | 4 | 17 | 84 | 70 | 176 |
| Total | | 3 | 9 | 40 | 170 | 148 | 370 |

**Table 36: Chi-square tests for university needs better way of teaching sustainability**

| Chi-Square Tests | | | |
|---|---|---|---|
| | Value | df | Asymp. Sig. (2-sided) |
| Pearson Chi-Square | .927[a] | 4 | 0.921 |
| Likelihood Ratio | 0.935 | 4 | 0.92 |
| Linear-by-Linear Association | 0.206 | 1 | 0.65 |
| N of Valid Cases | 370 | | |

**Table 37: Symmetric measures for university needs better way of teaching sustainability**

| Symmetric Measures | | | | | |
|---|---|---|---|---|---|
| | | Value | Asymp. Std. Error[a] | Approx. T[b] | Approx. Sig. |
| Interval by Interval | Pearson's R | 0.024 | 0.052 | 0.454 | .650[c] |
| Ordinal by Ordinal | Spearman Correlation | 0.013 | 0.052 | 0.259 | .796[c] |
| N of Valid Cases | | 370 | | | |

**Table 38 Chi-square tests for students are completely transformed to live sustainably**

| Chi-Square Tests | | | |
|---|---|---|---|
| | Value | df | Asymp. Sig. (2-sided) |
| Pearson Chi-Square | 12.418[a] | 10 | 0.258 |
| Likelihood Ratio | 13.75 | 10 | 0.185 |
| Linear-by-Linear Association | 1.72 | 1 | 0.19 |
| N of Valid Cases | 370 | | |

**Table 39: Symmetric measures for students are completely transformed to live sustainably**

| Symmetric Measures | | Value | Asymp. Std. Error[a] | Approx. T[b] | Approx. Sig. |
|---|---|---|---|---|---|
| Interval by Interval | Pearson's R | 0.068 | 0.051 | 1.313 | .190[c] |
| Ordinal by Ordinal | Spearman Correlation | 0.041 | 0.052 | 0.788 | .431[c] |
| N of Valid Cases | | 370 | | | |

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**Table 40: Chi-square tests for global education enhances sustainable living**

| Chi-Square Tests | Value | df | Asymp. Sig. (2-sided) |
|---|---|---|---|
| Pearson Chi-Square | 5.061[a] | 8 | 0.751 |
| Likelihood Ratio | 5.439 | 8 | 0.71 |
| Linear-by-Linear Association | 0.196 | 1 | 0.658 |
| N of Valid Cases | 370 | | |

**Table 41: Symmetric measures for global education enhances sustainable living**

| Symmetric Measures | | Value | Asymp. Std. Error[a] | Approx. T[b] | Approx. Sig. |
|---|---|---|---|---|---|
| Interval by Interval | Pearson's R | -0.023 | 0.054 | -0.442 | .659[c] |
| Ordinal by Ordinal | Spearman Correlation | -0.03 | 0.052 | -0.575 | .566[c] |
| N of Valid Cases | | 370 | | | |

**Figure 1:** Global education develops student to protect society and environment
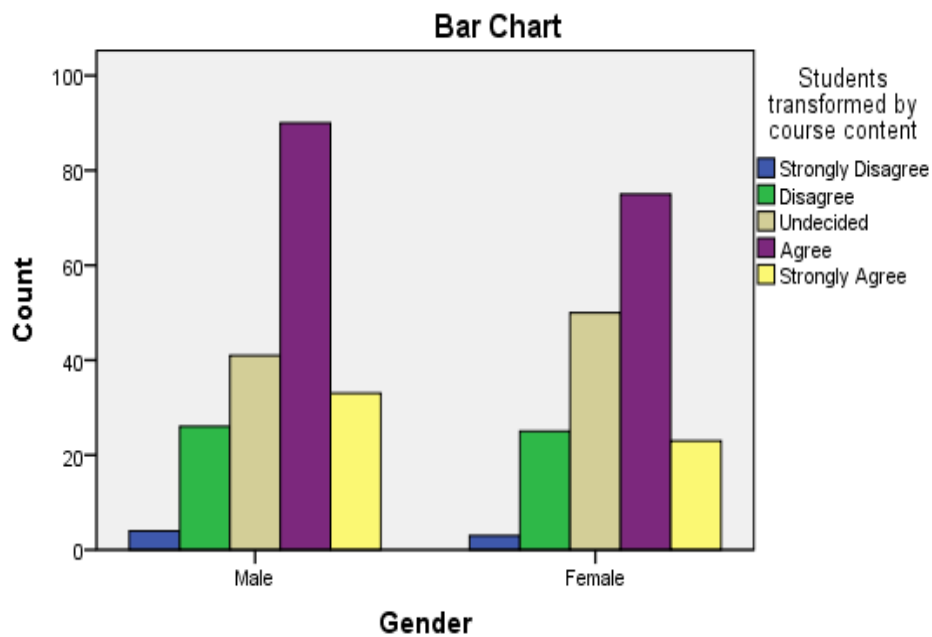


**Figure 2:** Gender based responses to the proposition that students are transformed by course contents

# Appendix 3: Questionnaire

**Social Demographic Data:**

**Gender:**   Male   ☐   Female   ☐

**Age:**   16 – 24 years   ☐   25 – 33 years   ☐   34 – 42 years   ☐

43 –51years   ☐   52 –60years   ☐   61 – above   ☐

**Educational Level:**   a. College   ☐   b. University   ☐

c. Any   other (specify) ……………………………

**Race:**   a. Afro-Caribbean   ☐   b. Asian   ☐

c. European   ☐

Mark × in the space provided against your chosen answer for each question below:

**1**. Individuals should live their lives in the way they can satisfy their own needs and still give future generations opportunity to satisfy their own needs.

a. Strongly agree   ☐   b. Agree   ☐   c. Undecided   ☐

d. Disagree   ☐   e. Strongly disagree   ☐

**2.** The knowledge and skills learners gain from university education enhance sustainable living.

a. Strongly agree   ☐   b. Agree   ☐   c. Undecided   ☐

d. Disagree   ☐   e. Strongly disagree   ☐

**3.** I have experienced a change in my attitudes and behaviours in such a way that help me to engage in my daily activities in the manners that help reduce environmental pollution, energy consumption and wasteful expenditures.

a. Strongly agree ▭     b. Agree ▭     c. Undecided ▭

d. Disagree ▭     e. Strongly disagree ▭

**4.** The contents of the course I study in the university make me to consider how the future generations could satisfy their own needs when I am striving to satisfy mine.

a. Strongly agree ▭     b. Agree ▭     c. Undecided ▭

d. Disagree ▭     e. Strongly disagree ▭

**5.** For education to help in improving learners' attitudes toward environmental protection and security of the future generation, less emphasis should be placed on making of profits by businesses while laying emphasis on making learners think about the future.

a. Strongly agree ▭     b. Agree ▭     c. Undecided ▭

d. Disagree ▭     e. Strongly disagree ▭

**6.** Universities still need to search for a better way of educating students on how to care for the environment, reduce poverty and protect the interest of the future generations of people.

a. Strongly agree ▭     b. Agree ▭     c. Undecided ▭

d. Disagree ▭     e. Strongly disagree ▭

**7.** Educational planners at university level need to consider including an approach to teaching and learning that can prepare the minds of learners to live a lifestyle that ensures the protection of the environment while striving to satisfy their personal and collective needs.

a. Strongly agree ▭     b. Agree ▭     c. Undecided ▭

d. Disagree ▭     e. Strongly disagree ▭

**8.** I have no idea about how to live a lifestyle that takes care of satisfying my personal needs and providing opportunity for the future generations of people to satisfy their own needs.

a. Strongly agree ▭     b. Agree ▭     c. Undecided ▭

d. Disagree ▭     e. Strongly disagree ▭

**9.** Education and learning at university enables me to think, act and live sustainably.

a. Strongly agree ☐ b. Agree ☐ c. Undecided ☐

d. Disagree ☐ e. Strongly disagree ☐

**10.** Before I started my course in the university, I had in mind that the knowledge I will gain from the study will help me transform the way I live my life.

a. Strongly agree ☐ b. Agree ☐ c. Undecided ☐

d. Disagree ☐ e. Strongly disagree ☐

**11.** After my first few months of study in the university, I found out that the actions I take with regard to things around me help to make the society more sustainable.

a. Strongly agree ☐ b. Agree ☐ c. Undecided ☐

d. Disagree ☐ e. Strongly disagree ☐

**12.** Building a society where both the present and the future generations have equal chance of survival will not be achieved without behavioural change at individual level.

a. Strongly agree ☐ b. Agree ☐ c. Undecided ☐

d. Disagree ☐ e. Strongly disagree ☐

**13.** The type of education students receive at university leads to the building of sustainable society.

a. Strongly agree ☐ b. Agree ☐ c. Undecided ☐

d. Disagree ☐ e. Strongly disagree ☐

**14.** The meaning of transformation and sustainability needs more explanations at university level

a. Strongly agree ☐ b. Agree ☐ c. Undecided ☐

d. Disagree ☐ e. Strongly disagree ☐

**15.** Global or international education has the power to transform learners toward sustainable living.

a. Strongly agree ☐      b. Agree ☐      c. Undecided ☐

d. Disagree ☐      e. Strongly disagree ☐

**16** I often switch off my light, T/V, radio when not in use; comply with the ethics of recycling and engage in proper waste disposal.

a. Strongly agree ☐      b. Agree ☐      c. Undecided ☐

d. Disagree ☐      e. Strongly disagree ☐

**17.** Studying in a university where people from different cultures come together has helped me to engage in conversations that related to how to protect our environment.

a. Strongly agree ☐      b. Agree ☐      c. Undecided ☐

d. Disagree ☐      e. Strongly disagree ☐

**18.** My university is doing enough to transform my life in the away that I can understand how to protect the environment and help in creating a sustainable future.

a. Strongly agree ☐      b. Agree ☐      c. Undecided ☐

d. Disagree ☐      e. Strongly disagree ☐

**19.** There is no need talking about how the future generations of people can survive when the present generation still live in poverty.

a. Strongly agree ☐      b. Agree ☐      c. Undecided ☐

d. Disagree ☐      e. Strongly disagree ☐

**20.** I have decided that I will never go back to live a lifestyle that does not ensure the protection of the environment and the satisfaction of both my needs and the needs of the future generations of people.

a. Strongly agree ☐      b. Agree ☐      c. Undecided ☐

d. Disagree ☐      e. Strongly disagree ☐

## Appendix 4:  Interview Guides

**Part 1: Major Questions:**

1 How did you relate with the environment with respect to sustainable living before coming to Anglia Ruskin University?

2. In what ways has your studying at Anglia Ruskin University affected your pattern of living with regard to sustainability?

3. In what ways do you think sustainability is reflected in the course you study at Anglia Ruskin University?

4. After a period of six months of studying at Anglia Ruskin University, what are the major changes you experienced in you ways you relate with the environment?

6. In what ways do you think global education has helped you to develop sustainable ways of living?

7. Do you consider your present way of living as sustainable?

8. Why do you consider your present way of living as important for the survival of the present and future generation of people?

9. In your own understanding, what do you think sustainability is?

10. Do you think you have been transformed from your previous ways of relating with the environment to a new kind of relationship that enhances sustainability?

11. In what ways has the university influenced the way you think about the environment?

12. In what ways do you hope to help encourage others to live sustainably?

13. What are the activities you engage in at the university to help in creating sustainable environment?

14. In what ways do you think Global Education field is helping to transform your lifestyle toward sustainable ways of living?

15. What are the skills you think the university has helped you to acquire about how to live sustainably?

**Part 2: Follow Up Questions:**

1 As a student in a school that hosts students from different countries, do you engage in any discussions with colleagues about sustainability?

2 Can it be inferred from what you have said that the university plays some significant role in helping you to develop sustainable ways of living?

3. With these changes you have experienced, are there some ways you now contribute towards reducing environmental crisis?

4. Are you saying in effect that global education is transformative, but that learners should be willing to be transformed?

5. How long do you think this your transformation could last?

6. So, you think that the survival of the future generations is very important?

7. Are you saying that the university is not actually changing the ways you relate with the environment?

8. Can it be concluded that you were living environmentally friendly life before coming to Anglia Ruskin University?

9. From where did you actually learn how to live sustainably?

10. Do you think individuals in India are also living sustainable lifestyle as your organisation is doing?

11. What course do you study at Anglia Ruskin University?

12. Are you taught all the things you have told me about environmental sustainability in the classroom?