

Trends in Science and Technology through Culture, and Language in Sustainable Development: the Nigeria Situation

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Abstract: This paper x-rays language as a vehicle for social change, social mobilization, social reconstruction and national development. It provides a vital medium for understanding, and permeates every aspect of life. A society lacking language would therefore really be a meaningless and underdeveloped society devoid of meaningful existence, a society of disorder, anarchy, hopelessness and helplessness. The paper went further to critically identify and examine the roles of language and culture. Language defines the path of socio-economic construction hence it is central to any discussion of development. This paper also x-rays culture as transmitted through language, material objects, ritual, institutions, and art, from one generation to another. It is the most important foundation of identity. It allows the facing of challenges, solving problems and being in harmony with the society, cultivating wisdom, and developing attitudes and abilities. It is a fundamental component of language. Its importance is universally recognized and encompasses how culture should be integrated into language instruction or what role technology plays in that process. The paper looks at science education as a vehicle for sustainable economic development. The various challenges faced by science education were also discussed. Finally, the paper also provides the way forward to the numerous challenges inhibiting the sustainable development of science education in Nigeria. Science and Technology is answer to the progress and sustainable development. Technology plays a basic role in wealth creation, enhancement of the quality of life and genuine economic growth and societal transformation. This paper looks at the concept of technology emphasizing the relationship between Science and technology, the key role of science and technology in sustainability. Use of technology in learning became the best resolution for continual teaching and learning activity. This paper evaluates experiences technologies through E-Learning education and the accessibility of the practicability and achievability of the virtual methods of learning. To achieve this, a descriptive survey-based questionnaire was used in the analysis of their relevance in Sustainable Development Goals (SDGs). It recommended that technology should be offered to provide new answers to the question of what people learn, how they learn, and where and when they learn for sustainable development. Technology should be incorporated to enable teachers and students to access materials outside textbooks in multiple formats. The paper concludes that language serves as a catalyst in national and sustainable development. And that government should transfer and interpret policies through it for developmental purposes.

Key Words: Culture, Education, Language, Science, Sustainable Development, Technology.

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INTRODUCTION

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Language is a communication device that is an influential instrument for spreading information and thoughts. Language is a tool employed to achieve social transformations. Culture is very relevant to human

identity. It is the foundation of human development. It establishes and creates membership in a community and facilitates the fostering of social integration and unity. Akpan (2010) asserts that Science contributes to

the quality of life in several ways. It guarantees that the breathing of air, and drinking of water to sustain. Science and technology are fundamental features of sustainable development globally. They contribute enormously to the material growth of nations. It is generally acknowledged that the approval of a scientific frame of mind is a condition for development.

Development is an extensive concept that involves all areas of human endeavour. It concerns the very security, health, welfare and safety of the population. Development policies have observed this as a challenge and a major area of concern. Sustainable development goals concern the structured principles that are envisaged to gather together the expectations of human development. According to Brundtland (1987) and Gladwin, Kennelly and Krause (1995), the nucleus of sustainable development is to meet the requirements of the present without compromising the capability of future generations to achieve their requirements. Consideration is also given to how present behaviour will impact the needs in the future. For illustration, when resources are utilized by humans as a result of overconsumption, the need for the resource will be unable to be accomplished in the future. On the other hand, human behaviour can also be reflected on the result of learning. Therefore, language and culture plays major role in sustainable development in terms of changing human behaviour.

This study aims to re-evaluate how science and technology can be exploited for the purposes of support sustainable development. There will also be a need to have attention to how and what science and technology can be used in changing human behaviour towards the achievement of sustainable development goals.

The Concepts of Science

Science as an organized body of knowledge shapes concepts, laws, theories and generalizations. Urevbu (2001) described it as a study of nature and natural phenomena to facilitate the discovery of their principles and laws. In the same vein, Christiana (2012) observed it as an intellectual activity conducted by man, which is intended to discover information about the natural world in which humans live and to discover the ways in which this information can be organized into meaningful patterns. Danjuma and Adakole (2019) affirmed that science could be illustrated as the structure and behaviour of the physical and natural world and society, principally through observation and experience. The above definitions indicate that science is connected with observation of the environment, which proper understanding is conceivable through experimental processes. It further illustrates that science is the sensory process of epistemological understanding of nature that helps man to logically discover and interpret the principles through which man controls his environment naturally. They further noted that it is the process of penetrating nature with the objective of discovering the laws that support man to live sustainably.

The scholars further noted that science is a part of learning that is entirely essential for development hence its connection to technology. Scientific development is essential for enhanced value of life, peaceful coexistence amongst peoples and the sustainable development of the planet. (UNESCO, 2015) reported that from the immediate fundamental essentials of life like access to potable water, food and shelter, to other issues such as conservation, management of water resources, energy resources, health, the environment, and communication, science provides the basis for action at local, regional, national and transnational levels. Science and technology have been identified as the major drivers of sustainable social development and the transformation of nations, which could lead to industrialization.

Science is that subdivision of knowledge that deals with the examination, observation and classification of facts and formulation of general truth. It recommends ideas and technology operationalizes them. Science makes clarifications and justifications on how an objective may be attained and achieved. According to Williams (1998) the "how" is translated into practical realization and from here, technology takes over and complements science. This, therefore, demonstrates that there is a symbolic relationship between science and technology. Science is a systematic investigation of truth and provides the foundation for technology. Without technology, science becomes impotent, and without science, technology does not exist. Nevertheless, technology is the application of techniques and not science which leads to enhancement in production. Formerly, science and technology comprised different traditions, preserving different identity areas of development and activities, but around the 19th century, there was progress and expansion of a closer relationship between the two. The constricting of that gap of different identities led to the birth of the concept of science and technology.

The Concepts of Technology

Technology deals with the harnessing and exploitation of nature for the advantage of man. It refers to the application of knowledge for practical purposes. It enhances human condition, natural environment and conducts other socio-economic activities. It is the systematic and organized application of collective human rationality to the solution of human problems through the affirmation of control over nature. Commenting, Egbogah (2012) posits that it is the totality of and complete application of man's knowledge, skills, tools and materials. It is the employment of scientific knowledge in the development and production of goods and services useful to man. It has the characteristics of practically problem-solving enterprise, which is driven by

scientific discovery based on societal needs. According to Obibuku (1983), it includes knowledge such as science, education, skills and know-how, organization such as institutional, aspects of methods of production, coordination, relationship to the environment and techniques such as ways of doing things, production process, the combination of human and material resources.

Technology therefore can be broadly classified into two major categories namely: (a) Material Technology- where knowledge is entrenched into technological products such as tools, equipment, agrochemicals, improved plant varieties or hybrids, improved breeds of animals and vaccines. (b) Knowledge-Based Technology- such as technical knowledge, management skills and other processes which are needed to successfully produce products or grow crops.

Obibuaku maintained that an appropriate technology is a form of technology which deals on the use of available resources in a given economic environment. It concentrates on tools and techniques which are carefully modified to their needs. It is accessible, manageable, and transferable and within the reach of the people. He further noted that appropriate technology is most suitably adapted to the conditions of a particular situation.

Appropriate technology has the following features:

- (i) Simple and easy to understand
- (ii) Manageable
- (iii) Inexpensive
- (iv) Flexible
- (v) Adaptable to changing needs
- (vi) Technically feasible
- (vii) Locally serviceable
- (viii) Employment generation potential
- (ix) Infrastructural compatible and compatible with the people's cultural practices.

The Concept of Sustainable Development

World bank reports that development is a concept that deals with the improvement of the well-being of the majority of the populace by ensuring people's freedom and enhancing of their economic security. The explanation to the achievement of these is employment of language. Development simply the provision of qualitative improvement of people lives. There are different types of development such as: social, political, economic, educational, environmental, cultural, and so on. Development is material progress, economic growth or reformation of social institutions and infrastructures. The primary objective of every form of development is to promote authentic human development. Walsh (2011) affirmed that development has recently shifted from economic progress towards a more humanistic view focused on the individual and the quality of life which is

often considered to be fundamental aspect of sustainable human development. This center on the interconnectedness of economics with political, socio-cultural and environmental areas as well as the necessities, capacities and potentialities of human beings.

Sustainable development is essentially a very wide concept to define since it is incessantly and constantly evolving. Sustainable development has become the buzzword in development discourse, having been associated with different definitions, meanings and interpretations. The concept consists of two words, "sustainable" and "development." Schaefer and Crane (2005) report that the definition with respect to sustainable development is the one proposed by the Brundtland Commission Report in 1987. The Report defines sustainable development as development of human societies that must live and that meets the needs of the current generation without compromising the ability of future generations to meet their own needs. Brundtland commission reports that it attempts to investigate and give emphasis to the development of the present without compromising the future of the upcoming generations.

Sustainable development is a process of improving and enhancing the collection of opportunities that enable people to achieve and attain their objectives and full potential over a period of time while maintaining the elasticity of economic, social and environmental systems. McKeown (2002) posits that fundamentally it entails a knowledge base which revolves round three essential concepts which are the economy, the environment, and the society. According to the scholar, the members of a society are financially empowered and responsible not to damage the environment in order that children's future is not compromised. Ajibade (2013) notes that it is very obvious and understandable that sustainable development attracts global attention to the critical need to address issues that have the potential of endangering 37. Diala and Maduka individual and collective existence and threaten to impact negatively to the wellbeing future generations. Mohieldin (2017) notes that sustainable development is an approach to development which uses resources in a way that allows them to continue to exist for others. Evers (2017) further relates the concept to the organizing principle for meeting human development goals while at the same time sustaining the ability of natural systems to provide the natural resources and ecosystem services upon which the economy and society depend. GosslingGoidsmiths (2018) states that sustainable development aims at achieving social progress, environmental equilibrium and economic growth. Exploring the demands of sustainable development, Ukaga, Maser and Reichenbach (2011) emphasise the need to move away from harmful socio-economic activities and rather engage in activities with positive environmental, economic and social impacts

United Nations Conference on the Human Environment reports that the concept of sustainability is a complex one and has been at the vanguard of the development movement since 1982, when it adopted a declaration for preservation and enhancement of the human environment. Singh and Titi (1992) described sustainable development as a process of change in which the deployment and use of resources, the direction of investments, the point of reference in technological innovation and exchange and institutional change reveal both future and present requirements. The Global Action Programme (GAP) on Education for Sustainable Development, ESD reported that any move towards development that balances economic and social progress, address cultural differences, agree with global, national and local requirements, and value ecological values and limits is the key to sustainable development.

Therefore, for any meaningful development to take place and be sustained there must be a medium through which the members of the community or any nation can be made to participate in the programs which will bring positive results. Language provides the only means through which members can be conscientized and positive attitudes inculcated into them. This is because language has a central and rather crucial role to play in the mobilization of the rural population for specific national development programs such as Agriculture, timber exploitation, fishing, etc. Language can create useful contributions by providing the skills required for rural development projects as well as other aspects of life in a modern society in the following areas: health, education, family planning, child welfare, home craft, literacy, road safety, alcoholism, drugs, etc. Everything considered, it is clear that when the appropriate language (aimed at the total mobilization of rural communities) is used, the people will naturally be drawn into being totally involved in government policies and once the community members are captured, the states and the nations will benefit and societal ills will be corrected thereby achieving a high rate of development. Language has therefore become a viable weapon for sustainable development.

The Sustainable development has the following goals:

are a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity.

these goals build on the successes of the Millennium Development Goals, while including new areas like climate change, economic inequality, innovation, sustainable consumption, peace and justice, among other priorities. These goals are interconnected.

the SDGs work in the spirit of partnership and pragmatism to make the right choices now to improve life, in a sustainable way, for future generations.

they provide clear guidelines and targets for all countries to adopt in accordance with their own priorities and the environmental challenges of the world at large.

the SDGs are an inclusive agenda.

They tackle the root causes of poverty and unite us together to make a positive change for both people and planet.

Key Role of Science and Technology in Sustainable Development

In Nigeria, science and technology hold the key to Sustainable Development. Technology performs essential role in wealth creation, enhancement of the quality of life and valid economic growth and transformation in any society. Egbogah (2012) upheld that the sooner Nigeria understands that her escape from poverty is relied on her investment in science and technology education, the better for her. Animalu (2001) cited in Egbogah (2012) clarified that there is a technological power vacuum in Nigeria expected to be filled through which every geo-political zone can mobilize its people for dedicated and selfless services. Fundamentally, technology is the most important engine for economic growth. It provides fundamental requirement for value addition to raw materials and people. It makes available the key to unlocking any country's potential in terms of decreasing over-head costs associated with out sourcing and creating employment opportunities.

Science and technology have been central in the progress and development of practically all the nations of the world. It has contributed greatly in all sector of the economy. Science and technology are intimately attached with development because; they have historical record of bringing advances that often lead to healthier, wealthier productive lives. They are key factors to clarifications to the most severe poverty alleviation and economic development challenges that is currently faced in the society.

Language.

Language is the key element of communication. Since there is no development without communication, we can state that language has a particularly important function in the achievement of the sustainable development. According to UNESCO, language is important because: "Through language, people communicate, share meaning and experience their sense of individual and community identity. Loss of language and culture is frequently accompanied by large human and social costs, including poverty, poor health,

drug and alcohol abuse, family violence and suicide.

Language is the major means of communication among a people. It provides a vital rallying point as well as an instantly recognizable form of identity for its users. In the world at present language functions as a vehicle through which nations progress to global recognition. This is because, for wider communication in the global world that has practically become a global village, we have come to understand that language facilitates, and also improves, enhances, encourages and promotes cross-cultural activities. Emeka- Nwobia (2015) asserted that language is the key that is capable of producing development to a people. Continuing, she noted further that the development can come in form of economic, technological development, social development, etc. All of these developments as she says are initiated, executed, conveyed and achieved by means of language.

Diala & Onyeama (2016) commented that language has the privileged as a medium in which senses are made pertaining to things in which meaning is produced and exchanged. Language develops and generates meaning through a representational classification. This therefore clarifies further that with the application of signs and symbols – whether they are sounds, written words, electronically produced images, musical notes, even objects-to stand for or symbolize to other people concepts, ideas and feelings. Through demonstration of meaning as generated and disseminated in a culture and even across culture. This illustrates that language is not entirely oral or written but involves mode, form and style.

Now, the United Nations Secretary General's High level panel on global sustainability recently reported that, at the moment, development has got to do with enhancing and improving the well-being of the majority of the populace, ensuring people's freedom and increasing their economic security. Language is the key to the achievement of all these. Again, in previous years people have attempted to live harmoniously and cordially with each other as human beings but as a result of the multiplicity of language at times meaningful co-operation becomes impossible. And when people are not living a co-operative life, it becomes difficult for them to simultaneously come together and make plans for meaningful development.

In light of the foregoing this paper posits that meaningful development is dependent upon the useful interaction of human resources and material resources of a given geographical area. When development takes place, new materials and products are manufactured while new roles become inevitable for the individuals of that given area.

Language assists in the attainment and satisfaction of the basic need of human beings through interaction at both individual and collective levels. Training in whatever form that take requires importing knowledge and skills as well as awakening and developing the intellectual potential of

the learner are achieved through language. The role of language as medium of instruction in the educational process is very important because the effectiveness of the training programme depends on whether effective communication and language has taken place during interaction. Appropriate language medium provides the knowledge, skills and values necessary for man to become effective agent of change. Language is then one of the essential and indispensable resources of man, necessary for his day to day transaction and activities.

Language and Sustainable Development:

Language application has a great deal to conceive and express to its environment. People constitute the soul of development in any society, while language constitutes the soul of communication among the people who execute sustainable development. Proper use of language provides the knowledge, skills and values necessary for man to become an effective agent of change. Walsh (2011) brought in a major interesting aspect of language by emphasizing that communication acts as the unifying nature through language. When people are able to understand each other and speak with one voice, development is often one of the surest beneficiaries.

Role of Language in Sustainable Development

Language is the important element of communication. There is no proper development without effective communication and language has a particularly important function in the achievement of the sustainable development. According to UNESCO (2003) report, language is significant and central because: "through it, people communicate, share meaning and experience their sense of individual and community identity. Lack of application of language and culture is often accompanied by large human and social costs, including poverty, poor health, drug and alcohol abuse, family violence and suicide. UNESCO further reported that recognizing the 39. Diala and Maduka deep significance that people attach to language creates a major insight for tackling poverty and hunger.

Culture

Culture can be defined as the sum of attitudes, customs, and beliefs that distinguishes one group of people from another. Culture is transmitted, through language, material objects, ritual, institutions, and art, from one generation to the next. Source: www.dictionary.com/browse/culture. It can be said that culture is the most important foundation of our identity. It is our essence, our strength, it allows us to face challenges, solve problems, be in harmony with the

society, cultivate wisdom, and develop attitudes and abilities.

Culture plays a major role in social cohesion and resilience. According to Diala (2015), culture is a fundamental feature in this study. Quoting Onwuanibe (1980), Diala further posited that culture is the ensemble and collection of activities of peoples' state of development with regard to intellectual, aesthetic, religious, moral, scientific and technical achievements, and the amendment which emerges from man's creative spirit as he poses and endeavours to answer questions around and beyond himself. It is described as man's way of life as he meets his physical and spiritual needs. Every society has culture. Culture is dynamic and adapt to changing circumstances. Some aspects of culture are peoples' identity, ethnicity, age, gender, sexual orientation, education, occupation and socio-economic status, and ability/disability.

Culture can also be used as desirable peoples' way of life and their values, beliefs, and attitudes that are used in daily bases. Culture is the sum total of attitudes, customs, and beliefs that distinguishes one group of people from another. It is transmitted, through language, material objects, ritual, institutions, and art, from one generation to the next. It is the most significant foundation of identity. It permits the facing of challenges; solve problems, creation of harmony within the society, cultivation of wisdom, development of attitudes and abilities.

Role of Culture in Sustainable Development

Culture has long been seen as a fundamental element of language. Though its importance is unanimously recognized, but there is no agreement on what the term encompasses, how culture should be integrated into language instruction, or on what role technology should play in that process. In particular, we will look at the growing interest in moving beyond traditional representations of culture in the classroom (i.e., the cultural products and traditions of the target language) to the concept of intercultural communication competence (ICC), defined by Fantini (2005) as the complex of abilities required to perform effectively and appropriately when interacting with others who are linguistically and culturally different from oneself.

Language is not only a communication tool but also an effective device for knowledge sharing, understanding between different stakeholders, peace building, and negotiation, social and economic changes. Culture is transmitted from generation to generation essentially through language. Dialogue based on cultural values can contribute to attainment of the SDGs. There is no development and no social cohesion without an effective communication and cultural strategy between all the stakeholders from bottom up and top down.

Theoretical Framework

The theoretical framework for sustainable development was emerged from 1972 to 1992 through series of international conferences. In 1972, the first major international conference on the Human Environment was held in Stockholm. This conference created considerable momentum and recommendations, which led to the establishment of the UN environment Program (UNEP) and numerous national environmental protection agencies at national level. The recommendations at Stockholm further elaborated in World Conservation Strategy (1980); which discusses about the collaboration between the International Union for the Conservation of Nature, the World Wildlife Fund (WWF), and UNEP; aimed to advance such development by identifying priority conservation agendas and key policy options.

CONCLUSION

This study has established that language served as a catalyst in national and sustainable development. This means that for any country to succeed in terms of development, it is not enough to just formulate policies and programs. It is even more important for government to be able to transfer and interpret such policies, findings and technology to the masses. This is to ensure that they understand what is being transmitted to avoid misunderstanding the information and to get them committed to the policies and programs for developmental purposes.

Thus, language helps to develop the mind, assess, appraise, evaluate and understand self, government and the governed where need be. From all that has been said, it is clear that language in its nature and function is all embracing in life and the all encompassing nature of language and her expressivity have good promises if well applied. Science and technology hold the key to sustainable development. Technology is achieved and attained through a combination of knowledge, methods, tools and skills. It is important to ensure sufficient development of man power in science and technology to guarantee the efficient utilization of abundant natural resources and reduce the drain on our treasury and independence on outside sources for industrialization. Sustainable development should be based on technologically self-reliance in the production of capital and consumer goods and raw materials. Technology based developments can occur only with concerted efforts to revitalization, development of personnel and creation of integrated industries that will involve close collaboration. Considering the roles of science and technology in sustainable development, it is important to stimulate and encourage demand for technology from private sector, renew emphasis on the creation of linkages between firms and knowledge

institutions, reformation of enabling environments for better use of knowledge, setting priority and evaluation right, promoting transparency, objectivity, selectivity and international best practices in science and technology funding, increasing access to ICTs and Government as a consumer of knowledge. Finally, every conceivable human activity revolves around language, culture, science and technology.

How to effectively use language and culture to reach the goals of sustainable development? Language is not only a communication tool. It is also an effective instrument for knowledge sharing, understanding between different stakeholders, peace building, negotiation, social and economic changes. Language is one of the key elements of communication. Culture is transmitted from generation to generation essentially through language. Dialogue based on cultural values can contribute to achieve to SDGs. There is no development and no social cohesion without an effective communication strategy between all the stakeholders from bottom up and top down.

Recommendations

Improvement on the role of science and technology depends on the adoption of appropriate policies and activities on at least four areas: human resources development, demand for knowledge in the private sector, public support of science and technology and access to information and communication technologies (ICT).

(a) Policies for science and technology in human resources development aim to provide science education at the basic secondary and tertiary level.

(b) "Implicit" policies for science and technology create an enabling environment that stimulates demand for knowledge in the private sector through, inter alia, a stable macroeconomic environment. (c) "Explicit" policies for science and technology in the private sector aim to further break down barriers to the use of knowledge. These policies may include support for firm-based training to encourage technology deepening, increase industry-academia linkage and public private partnerships, establish protection for indigenous knowledge provide tax incentives for firm engaged in rural development, and stimulate "clusters" of knowledge based industries.

(d) Policies for public support of science and technology must address the various aspect of the public role in the national innovation system, including: setting priorities for funding and research, providing financing, instituting open, transparent peer-review selection processes establishing governance regulatory and management mechanism, incorporating the results of research in public

policy decision, and monitoring and evaluating the system.

(e) Policies for information and communication technology should seek to maximize the access to and flow of knowledge by, inter alia, extending access of available ICT to a wider range of user, improving the

regulatory framework to facilitate a conducive environment for ICT growth, and providing training and education to facilities broader use of ICT.

(f) SDGs should address the role of communication in the process of peacekeeping and security in a current world in crisis. (g) Sustainable Development Goals should take evidence based research findings into account.

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