

Pedagogical and Andragogical Challenges for Environmental Literacy Education in 21st Century Nigeria

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Abstract

This paper commences with definition and elucidation of the concepts, *Pedagogy*, *Andragogy* and *Environmental Literacy*, and proceeds to examine the nature and factors of the challenges posed by pedagogy and andragogy for effective Environmental Literacy Education (ELE), at its three levels, in 21st Century Nigeria. Among the isolated factors which have elicited the challenges are the non-availability of core environmental literacy education subjects and the absence of environmentally-oriented education and training programmes for teachers and facilitators servicing the three levels each of the formal regular and adult ELE programmes. Furthermore, the adult ELE programmes experience scarcity of facilitators due to inadequate training and remuneration of potential personnel. This paper concludes, however, by expressing optimism that if the x-rayed factors of the pedagogical and andragogical challenges are appropriately handled, the challenges will abate significantly. A major recommendation made in this regard is that relevant agencies identified in this paper should collaborate to raise the status of ELE from a generally infused subject matter to that of a core subject area at each of the levels of formal regular and adult environmental literacy education and of the training programmes for teachers and facilitators.

Keywords: Pedagogy, Andragogy, Environmental Literacy Education, Teachers, Facilitators.

1. Introduction

1.1 The Concept of Pedagogy: Views of Renowned Educators/Educationists

The term, pedagogy, has its origin from the Greek word *pedagogia*, which is translated to mean “office of a child’s tutor, or someone who guides the child’s thoughts in the early years of growth”. From this reference, pedagogy, according to Collins English Dictionary (2001), has come to be interpreted in educational parlance to mean a number of things, including:

- i. The function or work of a teacher;
- ii. Teaching;
- iii. The art or science of teaching;
- iv. Instructional methods in education;
- v. The principles, practice or profession of teaching.

Pedagogy is usually associated with the education of children at the primary and secondary school stages. Going through various informed thoughts on child education and development, one encounters the views of a renowned French Social Scientist, Emile Durkheim (1858 – 1917) who believed that a child was born into the world as a *tabula rasa*, a blank mind, as it were, onto which society would have to engrave its values, norms and culture. Durkheim therefore saw the role of education and the teacher as being to imprint in the child a number of social and intellectual states required by society for stability and progress (Encyclopedia Britannica Ultimate Reference Suite, 2011). The child would therefore have to remain docile and simply serve as a receptacle to planned curricula.

A number of pedagogical theories appear to be predicated on the Durkheimian viewpoint on education. Even some teachers also believe in Durkheim and go ahead to pump the child with whatever knowledge they feel the child needs to succeed. However, many other social scientists have faulted the Durkheimian theory and so have some major educational thinkers also. For instance, the most important contribution of Fredrick Froebel (1782 -1852) to educational theory is seen to be in his belief in *self-activity* and play as essential factors in child education. The teacher’s role, according to Froebel, was not to drill or indoctrinate the children but rather to encourage their self-expression through play, both individually and in group activity. Froebel devised circles, spheres and other toys – all of which he referred to as “gifts” or “occupations” – that were designed to stimulate learning through play activities accompanied by songs and music. Modern educational techniques in kindergarten and preschool are much indebted to him. Again, Pestalozzi (1746 – 1827) in his pedagogical doctrines stressed that instructions should proceed from the familiar to the new, incorporate the performance of concrete arts and the experience of actual emotional responses, and be paced to follow the gradual unfolding of the child’s development. His ideas flow from the same stream of thought that influenced Johan Friedrich Herbart, Maria Montessori, John Dewey, and, more recently, Jean Piaget and advocates of the language experience approach such as R.V. Allen (Encyclopedia Britannia Ultimate Reference Suite, 2011).

Furthermore, the initial Durkheimian view that a child’s entry into school with little (if any) attainment

in written expression portrays the child as capable of learning much from human culture and that the child's progress was just a matter of memorizing, associating and practising, has been debunked by psychologist who have revealed that the growth of the pupil's intellectual powers must include a large element of development through different phases, beginning with simple sensorimotor coordination, going on to the beginnings of symbolizing, helped by the growth of language and play; and then on to logical thought (provided the material is concrete) and finally, in mid-adolescence unto the power to examine problems comprehensively, to grasp their formal structure, and evoke explanation. Whereas these pedagogical theories may still be somewhat relevant today, nonetheless, events of contemporary times have given rise to new theories of child learning and teacher practice in general.

1.2 Pedagogy and Andragogy Contrasted Contextually

A relatively new concept, *andragogy*, for facilitating learning, especially among adults, was advocated by a well-known Brazilian educator, Paulo Freire (Freire, 1970). Andragogy consists of learning facilitation strategies with a focus on adults as contrasted with children and adolescents of primary and secondary school age. It is often interpreted as the process of engaging adult learners using their learning experiences. The term, andragogy, has been used in different times and countries with various connotations. Nowadays, there exist mainly three understandings of the concept as detailed below.

1.2.1 Andragogy as Scientific Understanding of Adult Learning

In many countries, there is a growing conception of andragogy as the scholarly approach to facilitate learning among adults. The connotation here is that andragogy is the science of understanding (theory) and of supporting (practice) lifelong learning/education among adults.

1.2.2 Andragogy as an Academic Discipline

Widely, an unclear use of andragogy can be found with its meaning changing (even in the same publication) from adult education practice or desirable values or specific teaching methods to reflections or academic discipline in opposite to child pedagogy.

1.2.3 Andragogy as a Strategy for Facilitating Self-Directed Learning among Adults

In the United States of American (USA), the tradition of Malcolm Knowles, (Knowles, 1984) labels andragogy as a specific theoretical and practical approach to facilitation of learning based on a humanistic conception of self-directed and autonomous learning and teaching. Knowles' theory is associated with six assumptions related to motivation of adult learning; namely,

- i.** Adults need to know the reason for learning something.
- ii.** Experience (including error) provides the basis for learning activities among adults.
- iii.** Adults need to be responsible for their decisions on education. This makes necessary the involvement of adults in the planning and evaluation of their learning.
- iv.** Adults are most interested in learning experiences having immediate relevance to their work and/or personal lives.
- v.** Adults learning is problem-centered rather than content-oriented.
- vi.** Adults respond better to internal versus external motivators.

In all, with andragogical instruction, the learner develops in-depth knowledge of self and others through guided interaction that evokes the affective component of learning to motivate maximum fulfilment of potentials. Learning strategies focus on mature learning with a mentor that encourages and enables the mature learner by providing access to appropriate resources, and refraining from obtrusive interference. Thus, learning through andragogy is a needs based, adaptive, holistic exercise where personal interpretation, evaluation, decision making, reasoning and strategy are developed to obtain expertise. The learning is a self-directed acquisition, development and integration of knowledge. Interpersonal/intrapersonal intelligences are refined so that the learner becomes self-actualized with intrinsic motivation toward accomplishment. The learner adapts prior knowledge to new experience with others and the environment to develop knowledge of synergy. The level of learning is high order learning where strategy, expertise procedural knowledge, reasoning and analytical abilities are developed.

2. The Concept of Environmental Literacy (EL)

The definition of the term literacy has expanded well beyond what was generally understood as the ability to read and write and to communicate with written or printed symbols. In recent years, the definition has evolved to include the concept of internalizing information in order to make daily decisions based on real-life experiences. Thus, there are now notions such as adult literacy, computer literacy, visual literacy, cultural literacy, and so on. Environmental literacy has also emerged as an important dimension amongst these literacies.

Dissinger and Roth (1992) assert that environmental literacy is essentially the capacity to perceive and interpret the relative health of environmental systems and take appropriate actions to maintain, restore, or improve the health of those systems. The Charter adopted in a workshop jointly sponsored by UNESCO and

UNEP at Belgrade, Yugoslavia in 1975 (UNESCO-UNEP, 1976) defined the overall goal of environmental education as being to develop a world population that is aware of and concerned about the environment and its associated problems. The responsibilities of environmental educators thus include development of an environmentally literate society capable of internalizing environmental issues and making decisions based on real perspectives.

2.1 Levels and Content of Environmental Literacy

Environmental literacy is considered a major prerequisite for any society to make better environmental decisions. Given the fact that, as hinted above, all citizens need to have some level of responsible environmental behaviour, there is a need to examine and define existing levels of environmental literacy and how they fit into different sectors of society and the formal education system. Roth (1992) identified three levels of environmental literacy as follows:

- i) Environmental Literacy Level One (ELL₁), referred to as '*Nominal Level*', which indicates ability to recognize many of the basic terms used in communicating about the environment and to provide rough, unsophisticated, working definition of their meanings.
- ii) Environmental Literacy Level Two (ELL₂), called the '*functional level*', which shows a broader knowledge and understanding of the nature and interactions between human social systems and other natural systems; and
- iii) Environmental Literacy Level Three (ELL₃), the '*Operational Level*', depicting progress beyond functional literacy in both the breadth and depth of understandings and skills. Persons at the operational level routinely evaluate the impacts and consequences of actions, gathering and synthesizing pertinent information, choosing among alternatives, advocating action positions and taking actions that work to sustain or enhance a healthy environment. Such people demonstrate a strong, ongoing sense of investment in and responsibility for preventing or remediating environmental degradation both personally and collectively and are likely to be acting at several levels from local to global in so doing. The characteristic habits of mind of the environmentally literate at the operational level are well ingrained. They are routinely engaged in dealing with the world at large.

Roth goes further to summarize the content of Environmental Literacy as consisting of (Roth, 1992:16):

... a set of understandings, skills, attitudes and habits of mind that empowers individuals to relate to their environment in a positive fashion and to take day-to-day and long term actions to maintain or restore sustainable relationships with other people and the biosphere ...
The essence of EL is the way we respond to the questions we learn to ask about our world and our relationship with it; the ways we seek and find answers to those questions; and the ways we use the answers we have found.

3. The Pedagogical and Andragogical Challenges

Current (21st Century) pedagogical and andragogical challenges for Environmental Literacy Education (ELE) in Nigeria could be examined in relation to:

- i. The status of ELE and of the teaching/facilitating personnel,
- ii. Technological developments and their impacts on the environment and human behaviour.

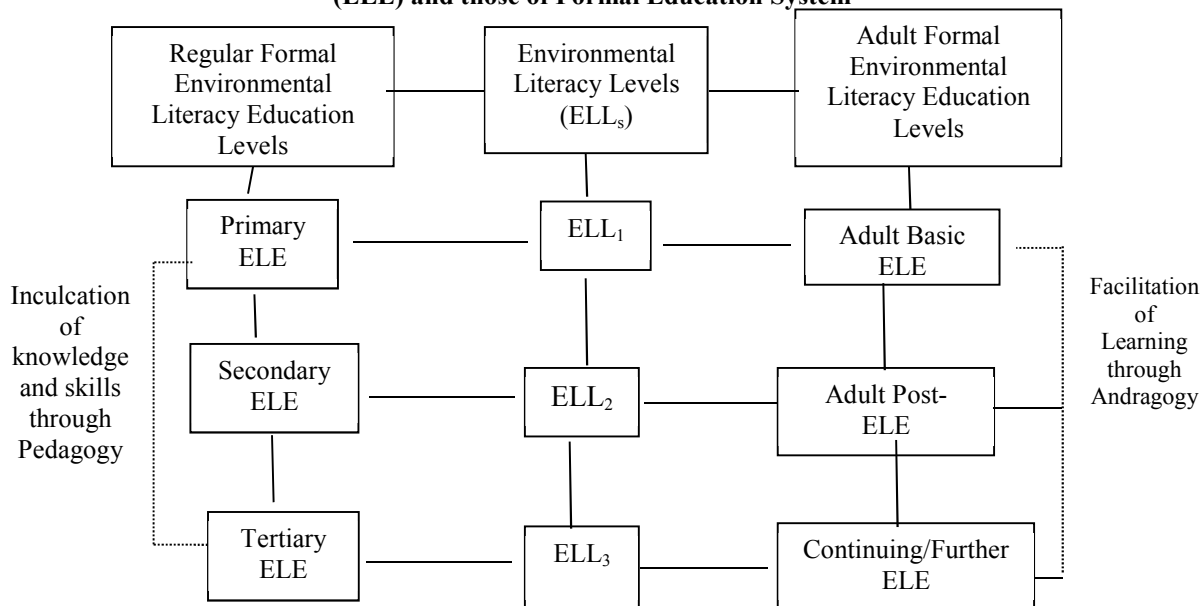
3.1 The Status of ELE and of the Teaching/Facilitating Personnel

Examination of this pedagogical and andragogical challenges in relation to effective dissemination of the content of EL at the three levels discussed above, could be more comprehensively done by considering Environmental Literacy Education (ELE) and a teaching/facilitating personnel alongside the three tiers of the conventional formal education system and the corresponding three levels of adult education as follows:

- i. Primary/Basic (Adult) ELE – corresponding with ELL₁.
- ii. Secondary/Post-Literacy (Adult) ELE – consistent with ELL₂.
- iii. Tertiary/Continuing (Adult) ELE – conforming to ELL₃

Fig 1 below gives a graphic representation of the said outlined corresponding levels of EL and formal education and their relevant methods of content dissemination.

Fig 1: Diagrammatic Representation of the Corresponding Levels of Environmental Literacy Education (ELE) and those of Formal Education System



Detailed discussion of the Diagrammatic Representation (fig 1) follows immediately below.

3.1.1 Primary/Basic (Adult) ELE (ELL₁)

At the primary school Level of ELE, the emphasis would be on development of the pupils' ability to recognize many of the elements or constituents of the human environment (air, water, land, forest, and so on), and the need to ensure, preserve and maintain the elements by, among other simple actions, avoiding their depletion or degradation. The challenge of dissemination of the contents is that ELE is not a core subject in the primary school curriculum in Nigeria. Rather, its contents are infused into various subjects of the primary education curriculum such as social studies, primary science, primary mathematics, English Language and civics (NERDC, 1996).

One of the policy goals of primary education in Nigeria is to “develop in the child the ability to adapt to the child’s changing environment” (Federal Republic of Nigeria, 2004:14). The policy further stipulates that the minimum qualification for teaching (at the primary school level) is the Nigerian Certificate in Education (NCE). Much as the Federal Government of Nigeria has been trying to implement this policy, there are still a good number of teachers at the primary level in some states of the country with lower qualifications (such as the Teacher’s Grade II Certificate). However, with reference to the topic of this paper, what matters here is the capacity of the teachers to disseminate even the obviously diffused content of environmental literacy education at the primary school level. A research report has revealed the general unsatisfactory status of both EE in the curriculum of the teacher training colleges and the actual teaching efficiency of the teachers at the primary level, especially with regard to ELE (Bosah, 2013).

Basic (Adult) Formal Environmental Literacy Education (ELE) also appear to suffer a more serious lack of attention than the case of the primary level. Indeed, it is only at the Non-Formal (Adult) Education level that some attention has been paid. That was in 1998 when the Nigeria Educational Research and Development Council (NERDC), in collaboration with the United Nations Development Programme (UNDP) organized a workshop to develop a curriculum for non-formal adult education to achieve, among other objectives, inculcation of knowledge and skills among beneficiaries from improvement of the environment and solution of environmental problems (NERDC, 1998). However, this curriculum also was limited in both scope and content, as it focused mainly on elements of the environment, there interaction and interdependence. Facilitation of the non-formal adult environmental literacy curriculum through andragogy has been another daunting matter because of the scarcity of trained adult educators to serve as facilitators. This challenge is exacerbated by the inadequate and irregular remuneration arrangements for the few facilitators available, due to the generally poor funding provisions for the entire adult education programme in Nigeria. Accordingly, many of the potential ELE facilitators are discouraged from accepting appointment (Adedokun and Adeyemo, 2013; Ukwuaba, 2015).

3.1.2 Secondary/Post Literacy (Adult) Environmental Literacy Education (ELL₂)

As in the case of the Primary/Basic (Adult) Level, ELE at the Secondary education level in Nigeria is not a core subject either for secondary schools or for the adult post- literacy curriculum. At the secondary school level, the Basic Science and Technology Curriculum (BSTC) of the 9-year Basic Education Programme, was revised in

2012 to infuse EE and Climate Change spirally into the Basic Education Programme. This smattering of the ELE content, as it were, is not pleasing to most secondary school teachers who strongly advocate that EE should be a core subject in the secondary school curriculum (Bosah, 2013). Even at that, research has equally revealed that generally, secondary school teachers in Nigeria have not acquired beyond ELL₁ (Ndulor, 2016). The obvious challenge here is that one would not expect the teachers to perform well beyond the primary school level in relation to ELE.

The case of the Adult Post-Literacy (ELL₂) programme is in no way different. EE is also infused into various subject areas (such as social studies, physics, geography) that may be of interest to post-literacy learners in their quest for General Education Certificates like the West African Examinations Council (WAEC) Certificate and the General Certificate of Education (GCE). The same secondary school teachers (who may be graduates of Universities, Colleges of Education or Polytechnics) and who have been identified as belonging to the ELL₁ also teach adults at the post literacy level. Most of these teachers also lack orientation in andragogy and may thus adopt pedagogical methods to *teach* rather than use andragogy to *facilitate* the learning process for their adult clientele.

3.1.3 Tertiary/Continuing (Adult) ELE (ELL₃)

At the Tertiary level, ELE in Nigeria is rarely a core subject area, except, maybe, in a few universities. What generally obtains is the pre-fixing of EE to various University undergraduate programmes. For instance, there are EE courses like Environmental Engineering, Environmental Chemistry, Environmental Micro-Biology, and so on. To make EE the compulsory subject, it should be, it has been recommended that it be instituted as a course within the usually compulsory General Studies (GES) Programmes of Tertiary Institutions in Nigeria (Eheazu, 2010).

Besides, “the need to improve on the existing syllabus/content of EE” has also been highlighted by a study earlier referred to here which focused on a Tertiary Teacher Training College (Bosah, 2013: 164). This latter revelation obviously epitomizes the challenge of lack of appropriate content and pedagogical/andragogical skills among tertiary education lecturers to effectively teach or facilitate ELE at the tertiary and continuing education levels respectively.

3.2 Pedagogical/Andragogical Challenges relating to Technological developments and their impacts on the Environment and Human Behaviour

The 21st Century came with progressive advances in Science and Technology and has thus ushered in the age of computer, sophisticated calculators and cell phones. In Nigeria, cable television networks and films on video CDs are proved to be negatively influencing the behaviours of viewers (especially adolescents) in such areas as dressing, alcoholism, sexuality, career choice and violent behaviour (see for instance, Okpala, Awujo and Okpala, 2012). Again, the cost of living in Nigeria is soaring higher and higher, making most civil and public servants (including teachers and knowledge facilitators) unable to optimally provide their basic needs.

Technological developments in the area of increased fossil fuel (petroleum) exploration, exploitation and use in Nigeria have led to significant generation of Green House Gases (GHGs) which have contributed immensely to the current twin phenomena of global warming and climate change with the attendant incidence of flooding, tsunamis, crop failures, and so on. Anthropogenic (man propelled) sources of air, water and land pollution and degradation as well as improper management and disposal of various forms of wastes in homes, market places and cities are rife in 21st Century Nigeria (Eheazu, 2016). The need to ensure, preserve and maintain the environment has also become pressing in the face of extensive deforestation, bush burning and use of wood as fire fuel.

These developments call for enhancement of the content of Environmental Literacy Education (ELE) at the various levels discussed under section 3 above. Again, the technologically induced developments also call for trained teachers and facilitators with appropriate levels of ELE to handle the suggested enhanced content of ELE curriculum. This is to obviate further pedagogical/andragogical challenges for the suggested enhanced ELE curriculum. Besides, there is equally a need to integrate all the technologically induced contents into core subject areas at the various levels of ELE.

4. Summary and Conclusion

The importance of Environmental Literacy Education (ELE) in the production of environmentally literate citizenry at various levels of environmental literacy (ELL₁, ELL₂ and ELL₃) cannot be ignored, especially given the capacity of such citizenry to contribute positively to overall environmental sustainability in the present 21st Century.

This paper has highlighted the equally important need to provide in 21st Century Nigeria, properly organized core ELE courses at the three tiers of the formal education system and the corresponding levels of adult basic literacy, post-literacy and continuing/further professional education. This is with a view to remedy the current practice in Nigeria of infusing ELE content into existing subject areas of the regular and adult formal

education programmes.

Lack of core courses which would encapsulate the content of EE at its various levels creates pedagogical and andragogical challenges for effective dissemination of an otherwise diffused subject matter. Further pedagogical and andragogical challenges are also posed for ELE by the general absence of environmentally oriented training programmes for production of qualified teachers and facilitators to handle the various levels of ELE.

Again, there is discernible apathy among the relatively few experienced adult educators available towards accepting appointment to be facilitators in the ELE programmes as a result of poor and irregular remuneration. The situation is made more critical by the deleterious impacts of the 21st Century technological developments on human environment and behaviour which beg enhancement of the ELE content and that of the training programmes for production of the relevant teachers and facilitators.

In the light of the foregoing analysis of the nature and factors of pedagogical and andragogical challenges for ELE in 21st Century Nigeria, one could, by way of conclusion, optimistically forecast significant abatement of the challenges if the various factors are diligently addressed by relevant authorities in Nigeria.

5. Recommendation

Following from the conclusion above, it would be pertinent to recommend *inter alia*, that the Nigeria Educational Research and Development Council (NERDC) which had championed development of an Environmental Education (EE) Curriculum for primary schools in Nigeria in 1996 and for Non-Formal Education in 1998, should be encouraged to go further to develop the necessary core courses in Environmental Literacy Education (ELE). This, the Council could do in synergy with other stakeholders like Ministries of Education, Agencies for Adult and Non-Formal Education and Teacher Training Institutions in Nigeria. The United Nations Development Programme (UNDP), which in the past had shown notable interest in the development of EE Curriculum in Nigeria, should also be approached to be part of the collaboration.

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