Eco-Literacy and Climate Action in the Primary School Curriculum in Kenya

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ABSTRACT

The 21st-century schools should create graduates who are deeply connected, responsible, and knowledgeable on climate matters. Whereas the United Nations' Sustainable Development Goals (SDGs) intend to limit climate change, the role of children in achieving the desired outcome remains indeterminate. Children ought to understand how nature works as a system. Embedding eco-literacy in the educational framework cultivates a generation of people who appreciate how nature works. It also equips learners with relevant knowledge, skills, attitudes and values that sustainably care for our planet. The Kenyan government has been implementing a policy of free and compulsory basic education for all children guided by the principle of universal access to education for every child, as enshrined in article 53, 1(b) of the Constitution of Kenya of 2010. The policy creates an opportunity for every child in Kenya to be eco-literate. The study aimed to examine the curriculum designs for pre-primary and lower primary Education in Kenya to promote ecological and environmental literacy. Therefore, this paper discusses the role of eco-literacy in nurturing the young generation towards climate action. It underpins the role of children by evaluating numerous learning areas in the environment entrenched in the curriculum designs. A descriptive design was employed in the study. The study relied heavily on the curriculum designs for pre-primary and lower primary schools available on the Kenya Institute of Curriculum Development's website. The paper concludes that creating an eco-literate young generation through the school curriculum is the most potent and sustainable way of mitigating the impact of climate change, now and in the future. In addition, curriculum designs have greatly promoted eco-literacy among children in Kenya.

Keywords: Eco-literacy, Climate action, climate change, curriculum

INTRODUCTION

In recent years, educators and researchers have developed a keen interest in the role of education in promoting sustainable development and specifically its great potential in combating climate change. One area of focus has been eco-literacy. Wong, C. C. & Kumpulainen, K. (2019) explains that Capra (1995) and environmentalist David Orr (1992) who are also the founder of a non-profit organization, Centre for Eco-literacy, coined the term eco-literacy in the 1990s. Ecological literacy (eco-literacy) refers to the ability of people to understand and appreciate the complex natural systems that support life in the world (McBride et al 2013). Though the term 'literacy' generally refers to the ability to write and read, the functional meaning is usually broader than this. It includes additional notions like digital literacy, cultural literacy, financial literacy, ecological literacy (eco-literacy) and environmental literacy, to mention a few. A literate person, in this context, refers to a person who has acquired basic knowledge, capabilities, competencies, attitudes and values that are useful in addressing numerous aspects of life.

The act of exposing young learners to environmental experiences creates a sense of environmental responsibility among children. It shapes their understanding of the planet and everything within it. This is the imperative of the concept of eco-literacy. The proponents of eco-literacy assert that classroom education should also be extended outside the classroom to enable interactions with the ecology and environment (Huang and Zhao, 2019. Schools promote eco-literacy by providing a good environment for children to learn how nature works through formal instructions and participation in outdoor education programs. McBride (2013)

explains that to be eco-literate means "understanding the principles of organization of ecosystems and using those principles for creating sustainable human communities." In this sense, the strategy promotes children's environmental awareness and understanding of the world they live in (Assadourian & Mastny, 2017). By allowing children to interact with nature-based education, green technologies and innovations, we create a generation of persons who not only know about nature but also fully participate in solving problems that encompass it.

The role of children in promoting sustainable environmental management and conservation cannot be understated. Cheng (2023) notes that policies should be adjusted to focus on children's relationship with the multidimensional world, enrich relational thinking in curriculum development, transform children's learning styles and promote sustainable development. Curriculum represents a systematic and conscious selection of knowledge, skills, attitudes and values that shape the way the school graduates view and interact with their world. Thus, any transformative education system seeks innovative curriculum solutions to improve the welfare of the people.

Curriculum designs in Kenya are guided by the national goals of education. The Kenya Institute of Curriculum Development (KICD) has been charged with the responsibility of ensuring that the curricula offered in Kenyan schools, except for the university level, are relevant and address the aspirations of the nation and its international obligations. The Institute's core function is to initiate and conduct research to inform curriculum policies, review and development. On these premises, the role of KICD in solving pertinent issues in the society, including climate, cannot be overstated.

The curriculum designs are developed after conducting a systematic situational analysis of the educational needs of the country through the establishment of various Education Commissions and committees (KICD, 2017a). The Kenya school curriculum are informed and aligned with the Kenya education to the Constitution of Kenya, 2010, Kenya Vision 2030, national education policies and international agreements, the Sessional Paper No 2 of 2015, Education for All (EFA), National Education Sector Plan (NESP), the Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs).

The 8th national goal of education in Kenya aims at promoting good health and environmental protection in the territory of Kenya and beyond. Consequently, the designers of curriculum at all levels were tasked with the crucial responsibility of promoting environmental and ecological literacy. Kenya is a signatory to several international treaties, obligations and commitments on environmental conservation and preservation, including the Vienna Convention for the Protection of the Ozone Layer of 1985. It was among the 65 countries across the globe with green economy–related strategies by 2022 (Musyoki, 2022). It also has robust laws on environment conservation and management entrenched in the constitution of Kenya of 2010 in articles 69, and 70, and in the policies and legislations such as Vision 2030, Climate Change Act of 2016, National Climate Change Action Plan 2018 – 2022, National Energy Policy of 2018 and the Non-motorized Transport Policy of 2015, Sustainable Solid Waste Management Act, Number 31 of 2022, the energy act, 2019, Green Economy Strategy and Implementation Plan (GESIP, 2016-2030) to mention a few. Article 69 (a) of the new constitution states that:

The State shall ensure sustainable exploitation, utilisation, management and conservation of the environment.

Whereas the above-mentioned policies and regulations seem robust, their implementation requires deliberate and innovative, inclusive and strategic methods of implementation. This paper argues that the most potent and sustainable way of achieving the intended outcomes of the mentioned policies is by entrenching it in the school curriculum starting with the pre-primary curriculum and consequently enabling Kenya schools to produce eco-literate graduates.

Rationale of the study

Research and innovations on climate change can remain inconsequential. Critical information about climate change is stored in libraries and online as books, journals and articles, mostly consumed by the elite adults. There is a need to ask these three pertinent questions. Firstly, who are consumers of the enormous knowledge,

innovations and green solutions generated through research? Secondly, who do we expect to implement the recommendations proposed in our study? Lastly, which strategies have researchers and innovators laid down to implement the findings of their research? In most of the developing world, there is a gap between knowledge and skills generated through research on climate change and the implementation of the recommendations.

Whereas the United Nations' Sustainable Development Goals (SDGs) intend to address climate change, the role of children in achieving the desired outcome remains indeterminate. There is a need for 21st-century schools to produce graduates who are deeply connected, responsible and knowledgeable on climate matters. Curriculum represents a systematic and conscious selection of knowledge, skills, attitudes, and values that shape the way the school graduates view and interact with their world. This paper reiterates that educators are the most strategic disseminators of eco-knowledge and eco-skills to all strategic consumers (learners). More so, children should be involved in this matter. According to the KICD report on the needs assessment for the school curriculum in Kenya, which evaluated the extent to which environmental and climate change aspects should be emphasized, 99.8% and 97.4% of head teachers indicated that climate change and environmental subjects, respectively, should be prioritized in the proposed curriculum. (KICD, 2016)

Specific objective of the study

The study intended to assess how the curriculum designs for pre-primary and lower primary Education in Kenya promote ecological literacy. It assessed how Kenya school curriculum addressed the pertinent issue of climate action, that is, the ecological awareness, and the efforts to mitigate the causes of climate change and how to adapt to its effects.

METHODOLOGY

The study employed a descriptive design and used both qualitative and quantitative data. The source of secondary data was curriculum designs for pre-primary and lower primary school that are available on the Kenya Institute of Curriculum Development's website. Textual analysis of relevant texts was done. The study focused on children: aged 4-8 in their Early Years of Education in Kenya (EYE), which comprised of Pre-Primary (PP1 & PP2) and Lower Primary level (Grade 1-Grade 3) while the upper primary comprises of grades 4, 5 and 6 as shown on the table below:

Table 1: Levels of Education and their characteristics

Level of Education	*School Composition*	*Average age*	*No. School Years*
Early Years of Education	Pre-Primary: PP1 and PP2	4-5 years	2
	Lower Primary: Grades 1-3	6-8 years	3
Middle School	Upper Primary: Grades 4-6	9-11 years	3
	Junior School: Grades 7-9	12-14 years	3
Senior School	Senior School: Grades 10-12	15–17 years	3

The table above indicates that the entry age at which formal education commences in Kenya is at age 4. In the paper, discussions have focused on the curriculum touching the children within the brackets of Early Years of Education. The boldest, strategic, game-changer, and an innovative action done by curriculum developers was to promote eco-literacy in Kenya's education system. The presentation of the results is a descriptive approach.

Eco-Literacy in Early Years of Education Curriculum in Kenya

This section outlines the major findings of the study. The study found that at the EYE level of education, a learning area (subject), namely 'Environmental Activities', has been embodied at the onset of formal education, at the pre-primary school level. Unlike the former 8:4:4 system, which had unstructured and blurred environmental studies, the new system (CBC) offers structured, deliberate, ecological and environmental knowledge to children in the early years of Education. At the age of three years, learners are equipped with eco-knowledge, skills, attitudes and values that appreciate the relationship between man and nature.

The education curriculum in Kenya is designed to create holistic, developed individuals who exhibit the competencies of critical thinking, creativity, communication, collaboration, digital literacy and lifelong learning. The figure below shows the interplay between Eco-literacy and competencies that developed among learners in primary schools in Kenya.

Fig. 1: Interplay between Learning areas (Eco-literacy) and Basic Competencies.

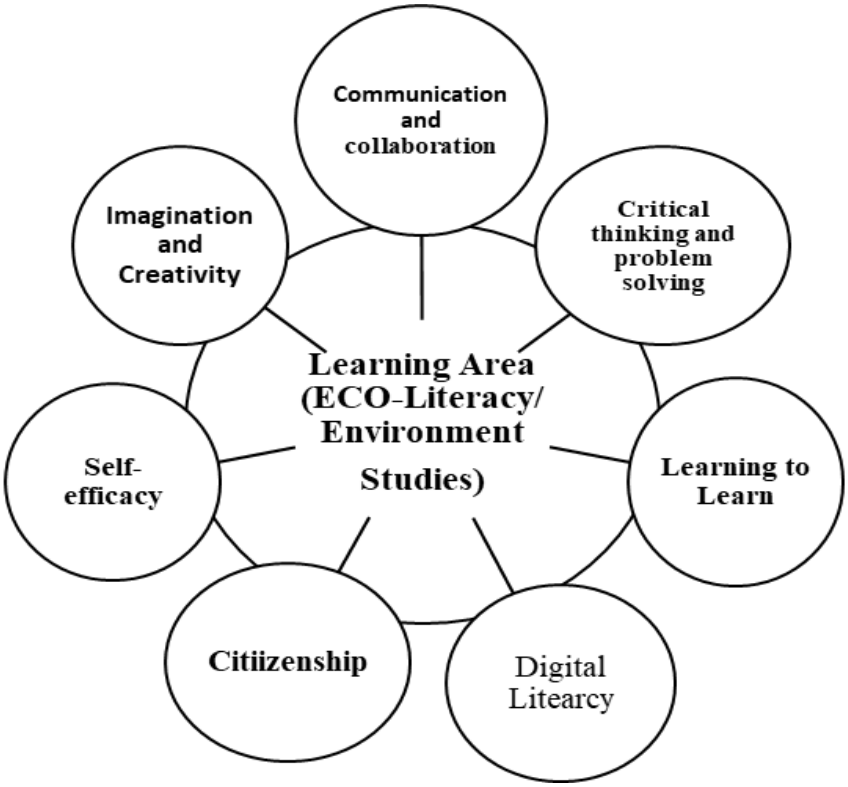


Figure 1 above shows the interrelationship shown in the basic competencies prioritized in the curriculum shall be fed/and or be fed by the learning experiences targeted in numerous learning areas because education is a system. For instance, a digitally literate learner is expected to use his/her digital skills to participate and explore Environmental activities. In addition, the instructor is expected to bring the outdoor experiences in the class using digital gadgets such as desktop computers, laptops, projectors, smartphones, flash disks and e-readers. The system also intended to promote values of love, respect, unity, responsibility, peace, social justice, patriotism, and integrity to the children. This phenomenon cultivates an enabling environment for teaching and learning about man and his environment.

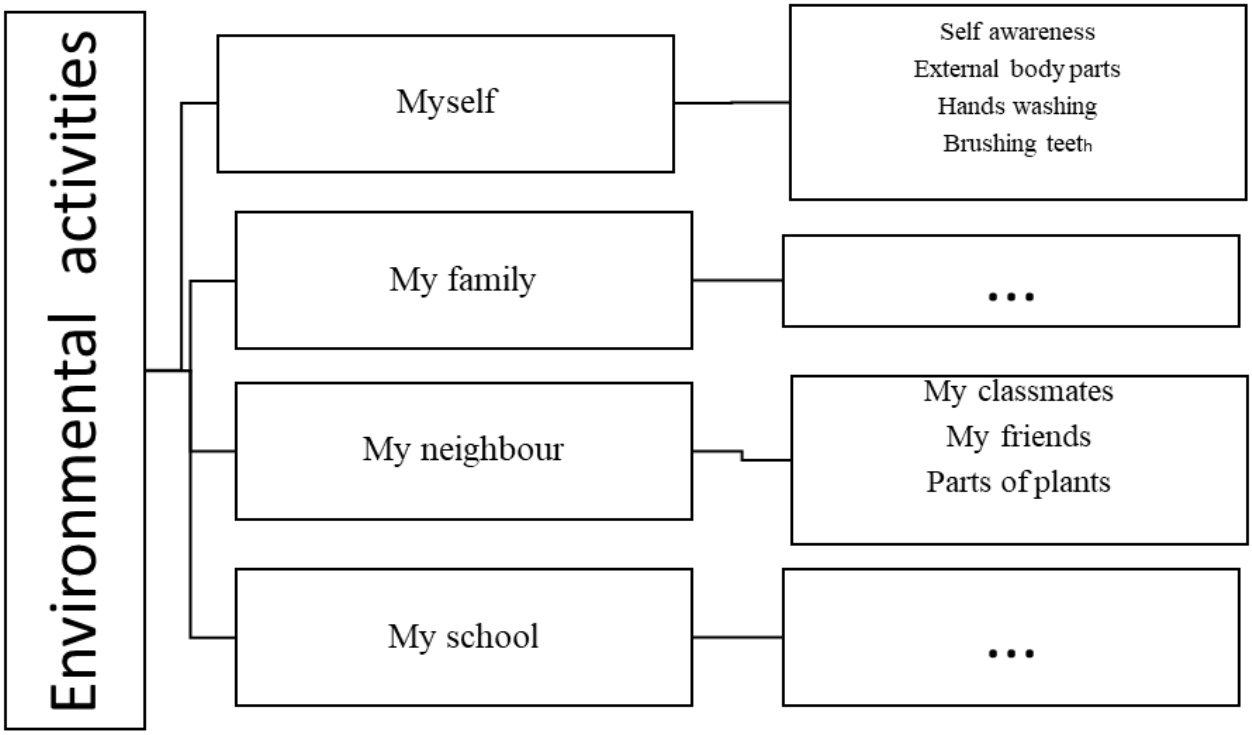
The content analysis of the EYE's curriculum shows that ecological literacy has been mainstreamed through a subject area called Environmental Activities. This critical learning area is taught in pre-primary 1, pre-primary 2, grade 1, grade 2, and grade 3. In the upper primary (Grades 4-6), ecological and environmental literacy is integrated into the curriculum designs within other learning areas. The mainstreaming of eco-literacy in pre-primary education is articulated in the six expected outcomes of studying Environmental activity, which can be summarized in one statement that, by the end of the level, learners should be able to explore the immediate environment for learning and enjoyment (KICD, 2017b, 2024). The KICD (ibid) gives the essence statement that indicates that:

(a) Environmental activity in pre-primary entails the study of the relationship between man and his environment.
(b) Environmental activity area comprises the local natural environment and its care, social relationships, health practices and safety.
(c) The learning area provides opportunities to the learner to explore, experiment and interact with the immediate environment, which resonates with Vygotsky's social-cultural theory, which asserts that learning is majorly a social activity.

(d) The learning area will provide opportunities for the learner to acquire skills and knowledge to enjoy learning, promote good health, safety, and environmental conservation and appreciate rich cultural diversity. (KICD, 2024, pg. viii)

It was noted that learning experiences in the curriculum design are arranged from simple to complex, resonating with the Constructivism learning theory. Constructivism's central idea is that learners build new knowledge upon the foundation of previous learning (Phillips, 1995). The first role of a teacher is to understand preexisting conceptions within the learners and guide them, then build on them (Oliver, 2000). Thus, for the young minds to understand and appreciate the whole environment, the designer puts "myself" as the epicenter of further learning. Learners are active participants in constructing their understanding and knowledge. The work of the curriculum designer and the teacher is to organize learning concepts from what is known to them to what they should learn. Content analysis in pp1 and pp2 were arranged from familiar (simple) to unfamiliar (complex), as follows:

Figure 2: Structure of Environmental Activities For Pp1 And Pp2



From Figure 2 above that in pp1, under the strand "my neighborhood," it can be noted that, there is a sub-strand namely "parts of a plant', where the learners are expected to name the parts of the plants, care for a plant and appreciate the importance of plants in their immediate environment. This basic knowledge forms the basis of constructing more complex knowledge. Learning experiences are enhanced through collaboration, creativity and personal desire to learn.

The pedagogies for the pre-primary Environmental activities are play-based and nature walks, where children naturally learn through play by engaging in and making sense of the environment. Some of the learning activities proposed by the curriculum designers include identifying the parts of the plants/trees, touching the plants, reciting poems about parts of the plants in groups, drawing pictures of parts of plants, sorting flowers according to colors, singing songs about parts of plants, planting seeds in the garden corner, watering plants in the immediate environment, talking about how to care for the plants, watching and listening videos on parts of plants, talk about plants, playing games that mention parts of plants amongst others. Teachers are expected to create supportive learning environments.

The curriculum designs also allocate a reasonable amount of time for learners to interact with ecological and environmental information.

Table 2: Lesson Allocation for Pre-Primary

	Learning Area	**No. of Lessons per week**	**Percentage**
1	Language Activities	5	20%
2	Mathematical Activities	5	20%
3	Creative Activities	6	24%
4	Environmental Activities	5	20%
5	Religious Activities	3	12%
6	Pastoral Instruction Programme	1	4%
	Total	**25**	**100%**

Source: KICD: 2017/2024: iv

Environmental Activity has been allocated 20% of the available lessons. The learning area has been given similar weight to the mathematics activities. In lower primary school, environmental activities have been allocated 4 lessons per week, which is 12.9% of available lessons.

Table 3: Lesson Allocation For Lower Primary (Grades 1-3)

	Learning Area	**No. of Lessons per week**	**Percentage**
1	Indigenous Language Activities	2	6.45%
2	Mathematical Activities	5	16.12%
3	Kiswahili language Activities/Kenya Sign Language	4	12.90%
4	Creative Activities	7	22.6%
5	Environmental Activities	4	12.9%
6	Religious Education Activities	3	9.7%
	English Language Activities	5	16.12%
7	Pastoral Instruction Programme	1	3.22%
	Total	**31**	**100%**

The content analysis of lower primary shows that the environmental activities are built on the foundation created at the pre-primary level. The environmental activities are integrated with environmental, hygiene and nutrition knowledge. At this level, hands-on activities are given more prominence. Learning becomes more practical. The skills of observation, classification, measuring, prediction, and environmental conservation are further developed to enable the learner to appreciate and enjoy their immediate environment. The strands are three, namely, social environment, natural environment and resources in our environment. Each strand is then divided into numerous sub-strands at different grades, as shown in the table below:

Table 4: Strand and Sub-strands in Lower Primary Environmental Activities

	Strand	**Sub-Strand**		
		Grade 1	**Grade 2**	**Grade 3**
1	Social Environment	Our home	Our home	Our living environment
		Cleaning my body	Family needs and wants	Family needs
		Family needs	Our school	Food in our environment
		Our school	Our national flag	Our community
			Our rights and responsibilities	Cultural events
		Our market	Our market	
2	Natural environment	Weather and the sky	Weather	Weather
		Sound	Soil	Soil
			Light	Heat
3	Resources in our environment	Water	Water	Water
		Plants	Plants	Plants
		Animals	Animals	Animals
				Waste materials

Source: KICD, 2017, 2024

Table 4 shows some concepts for promoting a sense of connection and appreciation to the immediate environment amongst learners at the lower primary level. Teachers' responsibility is to ensure that the statement of essence and the expected outcomes are achieved by exposing learners to the guidelines stipulated in the discussed curriculum designs.

Another aspect embedded in curriculum designs is the interdisciplinary approaches, which are also used to promote eco-literacy by incorporating environmental education across various disciplines. The designers of the curriculum expect students to gain a comprehensive understanding of ecological issues while teaching related learning areas. For instance, in the language learning area, eco-linguistic concepts are expected to be incorporated through environmental concepts through poems, composition writing, composing songs and other literary materials that enhance eco-knowledge and skills.

The curriculum designs have also incorporated experiential learning, where field experiences and environmental projects are used to enhance the learning process. Teachers are expected to make learning real and practical. In other words, effective learning only occurs through a hands-on approach when learners interact with their environment, especially through a scenario.

Children are also expected to participate in community Service Learning. The community involvement and collaboration aspect in the curriculum design is designed to engage children in community-based environmental initiatives. This fosters a sense of responsibility and teamwork among young learners. It provides linkages learnt in various learning activities and real-life experiences (KICD, 2017a). Learners under CBC are involved in activities like community tree planting, making learning more engaging and enjoyable. Critical thinking, creativity and problem-solving skills are competencies that are being promoted under CBC and are useful in analyzing and addressing environmental challenges that affect society. The teacher is expected to undertake age-appropriate community-based activities to promote teamwork and general involvement in solving the pertinent issues affecting society, including climate change.

CONCLUSION

This paper has discussed the role of curriculum design in Kenya in promoting eco-literacy and nurturing a young generation that appreciates the ecology and the environment. The curriculum designs for pre-primary and lower primary levels have allocated a reasonable amount of time for learners to interact with ecological and environmental information. The paper has demonstrated how the curriculum designs are tailored towards creating environmentally conscious children at the tender age of three. The study appreciates the efforts that the Kenya Institute of Curriculum has made towards nurturing a generation that is committed to environmental conservation and management.

The paper has also discussed how ecological and environmental literacy influences young children's behavior and attitudes towards numerous objects in their immediate environment. It pinpoints the pivotal role of the teacher in interpreting and implementing numerous environmental activities in promoting an eco-literate child. The study reveals that the curriculum designers are pivotal in shaping environmental policies and environmental advocacy.

The content analysis of curriculum designs for pp1, pp2, grade 1, Grade 2 and grade 3 has revealed that eco-literacy has been integrated effectively into the educational system through various interventions like the inclusion of Environmental Activities Learning area in the early years of education. The study has shown how the environmental Activities learning area has been designed with content and learning experiences aimed at encouraging sustainable lifestyles among children.

This paper argues that educated individuals can significantly influence environmental policies and advocate for sustainable changes at various levels. Eco-literate individuals are more likely to embrace sustainable living practices, thus strengthening community resilience. The paper concludes that individuals with a sufficient understanding of environmental issues are the hope of the current and future generations. Therefore, embedding eco-literacy in the educational system, especially for young children, is the most effective way to cultivate a generation of individuals who love and care for our planet, thereby ensuring sustainable

development. The curriculum's intentions are well documented, but there are potential gaps between policy and practice that may require further analysis.

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