

Secondary School Students' Participation in Environmental Action: Coercion or Dynamism?

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This article reports emerging findings from qualitative research in 22 secondary schools in Bungoma District of Kenya. It focuses particularly on the nature and dynamics of students' participation in environmental action within the framework of the established school curriculum. Drawing on in-depth pilot study during the first year of the research, the paper discusses the type of environmental activities in which students frequently participate in their local environments and the mode of such participation. Informed by the relevant literature, it is shown that dynamic qualities, which seem to facilitate environmental action, develop in those students exposed to active environmental education. It is hoped that this paper will lead to further dialogue in this critical area of practice and research.

Keywords: Participation, Coercion, Qualitative Research, Dynamic Qualities, Environmental Action, Environmental Education

INTRODUCTION

Background of the Problem

Although the exploitation of the Earth's resources for development purposes started since the beginning of humankind, much of the environmental degradation we see today is the result of increased human consumption of natural resources which began during the industrial revolution. Since that time up to now humankind's relationship with the planet Earth has been guided by the "anthropocentric paradigm": That nature is separate from, and it subordinates, the needs and wants of humans. Hence resources have been exploited indiscriminately as if this has no long-term effect on humans themselves. As a result of humans' unsustainable development activities, the planet Earth is now in critical danger.

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To correct and prevent any further environmental degradation the United Nations Conference on the Human Environment held in Stockholm in 1972 urged all countries of the world to incorporate environmental education in their curricula at all levels of education. A follow-up conference held in Tbilisi in 1977 outlined the objectives and implementation strategies of environmental education. The primary goal was to empower the world population to maintain and enhance environmental quality. One of the key specific objectives was that environmental education should provide individuals and social groups with an opportunity to be actively involved at all levels working towards the resolution of environmental problems (UNESCO, 1980). Environmental education was therefore symbolic of modern environmentalism espousing the "biocentric" and "new environmental" paradigms that had began and have continued to gain ground all over the world. Modern environmentalism start with the premise that we bear the responsibility of our actions towards nature and therefore our eyes and hearts must be educated. The anthropocentric view of nature as being separate from and external to human consciousness is thus challenged.

The United Nations Conference on Environment and Development held in Rio de Janeiro in 1992 reiterated, in Agenda 21, that through environmental education school children are obliged to participate actively in guarding the quality of the environment. This is because they comprise half of the world population and are highly vulnerable to the effects of environmental degradation now and in the future (United Nations, 1994). Moreover, secondary school students are usually receptive and strongly motivated and are capable of understanding the implications of environmental destruction and of trying to take preventive action (UNEP, 1990). However, for school children to meaningfully participate in environmental conservation activities, they should possess dynamic qualities gained through environmental education (Kelley - Laine, 1991). Dynamic qualities are personal qualities of thought, feeling and action which develop in the students through a process of learning in which understanding and action are key features (Posch, 1991, p.3).

Statement of the Problem

As efforts to intensify environmental education in schools have continued to increase over the years, a considerable number and variety of claims have been raised severally concerning the inability of the students to participate in environmental action. In Kenya for example, whereas environmental education has existed in secondary schools since 1985, concern has been raised to the effect that students do not adequately participate in protecting and enhancing environmental quality. In 1991, for example, the Minister for Environment and Natural Resources voiced his concern for the lack of practical conservation principles in the students' daily activities (Kenya Times, Nairobi, 19 August, 1991). Similar observations have been made in other parts of the World (Tubianosa, *et al.*, 1995). It is becoming increasingly necessary to see the evidence supporting these claims.

Research dealing with students' participation in environmental action has tended to focus on the products in the environment rather than on the process involved in arriving at such action. The studies done by Buskov (1991), Folkedal (1991), Pieters (1991), Sutti (1991), Gagliardi and Alfhtan (1994) and Lindhe *et al.* (1993) are valid examples. Most of these researchers employed the systems – analysis approach that focuses on easily quantifiable variables relating to the quality of the products arising from environmental action projects as directed by the teachers. Data produced in this way may not necessarily provide an insight into the process of students' participation in environmental action. As Emmons (1997) observes, the relationship between environmental education and positive environmental

action is a complex one and requires a deeper understanding of the contributing factors. This is because a behavioural manipulation of many variables can result in students' participation in environmental action in the manner that is pedagogically undesirable. Research designs that elicit phenomenological data could help us understand students' participation in sustaining and improving environmental quality.

Purpose of the Study

The purpose of this study was therefore to understand the impact of environmental education on secondary school students' participation in environmental action. The following specific research questions were addressed:-

1. In what environmental activities do the students participate to protect and improve the quality of their local environments?
2. How do the students participate in protecting and improving the quality of their local environment?
3. Which dynamic qualities affect students' actions in their local environments?

METHOD

This was a descriptive survey study which focused on the secondary school students' participation in environmental action. The method used to conduct the study is described more fully below.

Population

The study was conducted in Bungoma District, Kenya. The target population was 2,900 fourth form students (ranging in age from 16-18) who studied biology and geography in 111 secondary schools. The two subjects were selected because they contained more environmental topics than other subjects. The students were therefore presumed to have attained better competence in environmental education than the rest of the population.

The Sample

A modified stratified random sampling technique based on three geographical regions of the district was used to select the sample. From each stratum 20% of the schools were selected, giving a total of 22 schools. The accessible sample of students in these schools was 899, this being 31% of the target population. Because of fiscal and time constraints purposive sampling based on first term (1995) performance in the two subjects in teacher made tests was used to select 272 students, this being 30.25% of the accessible sample. In selecting the

Table 1. Sample Size and Distribution

Geographical Regions	No. of Schools	No. of Schools in sample (20%)	No. of Geography & Biology students	No. of student in sample (30%)
Mount Elgon & Slopes	12	2*	80	24
Middle Level Upland	53	11	493	149
Lowlands	46	9	326	99
Total	111	22	899	272

* Rounding off error

sample from each school only the top 30% were selected. It was assumed that better performers in the two subjects would provide greater information required for the study than their counterparts. Table 1 summarizes the size and distribution of the sample.

Pilot Study

The pilot study was carried out at Busakala secondary school to collect data that would help the researcher to develop and test the instruments. In the first phase which took twelve months qualitative data were collected through in-depth interviews, document analysis and participant observation.

In-depth interviews involved 11 informants. The informants included four top fourth form students in geography and biology, one geography teacher, one biology teacher, one teacher in charge of environmental club and four fourth form students who were members of the environmental club. All informants were interviewed individually. The interviews were semi-structured and allowed open-ended responses on the environmental matters at issue. The interviews focused on students' environmental action in their school, community and home environments. The interviews were based on the observed state of these environments. The researcher also visited the students' homes to validate the data.

The documents analyzed included syllabuses, past examination papers and students' textbooks and notebooks. The data collected from the documents focused on the kinds of environmental action activities students engaged in, the kinds of teaching methods and procedures employed in the activities, and the factors that supported or constrained teaching and learning environmental issues.

The researcher also joined students in activities such as games, lunch and tea break, and manual work assignments to observe how they interacted with the environment. A detailed account of these interactions was written later in the day. The data were analyzed to determine the environmental activities in which students

frequently participated their mode of participation in the activities and the role of dynamic qualities in their environmental action.

Table 2 indicates a summary of the four environmental activities listed in each of the four broad categories in which the students frequently participated.

Table 2. Environmental Activities in which students Frequently Participated in Local Environments

Category of Environmental Activities	Individual Environmental Activities
A. Controlling visual pollution	1. Clearing cobwebs 2. Clearing garbage 3. Clearing graffiti 4. Clearing derelict
B. Taking environmental health and safety measures	1. Slashing grass/bush 2. Cleaning/repairing dormitories, classrooms, residential premises. 3. Boiling drinking water 4. Cleaning toilets/household gear
C. Improving environmental aesthetics	1. Planting flowers 2. Caring for flower beds 3. Landscaping 4. Pruning hedges
D. Conserving resources	1. Planting trees 2. Caring for trees 3. Conserving soil 4. Conserving water

It was also recognized that environmental action was mainly realized through punishment, routine manual work assignments, clubs, learning at school, and personal initiative. Eight dynamic qualities were identified which seemed to facilitate environmental action among some students. The qualities were

categorized into basic and integrated dynamic qualities. The basic dynamic qualities included: showing sensitivity to environmental quality; monitoring one's action in relation to environmental quality; showing concern for environmental quality; and showing interest in environmental management. The integrated qualities included: Accepting and seeking responsibility for environmental action; Exercising initiative in conserving environmental quality; showing commitment to environmental conservation; and showing independence of thought and action in environmental action.

In the second phase one interview schedule (Appendix A) was developed based on the data gathered. The first section of the instrument consisted of two tasks and focused on the various environmental activities in which students frequently participated in their local environments, and the mode of participation in the activities.

The second section of the instrument which consisted of eight tasks elicited responses that would help determine the type and role of dynamic qualities developed by the students. The dynamic qualities were ascertained with the help of the second instrument titled 'Indicators of Dynamic Qualities Guide'. The instrument was developed from the characteristics identified by Elliott (1990), Hungerford *et al.* (1989) and Vivian (1973) (See Appendix B).

The face and content validity of the two instruments was ensured by preparing a definition of what each purported to measure and took this along with the instruments to three independent researchers who scrutinized them for suitability of format and content. The interview schedule was then modified in light of their comments and administered to the third form students in the same school. The responses given by the students also helped in refining the instrument.

Procedures

In the main study each participant was interviewed with regard to his or her local environment (School, community, home) to identify the environmental activities he or she frequently participated in and the mode of such participation. For participation in any activity to merit being frequent, the student should have been involved in all the four major activities in each of the four broad categories for at least two days in a week in the last four or more months. To determine if they had developed a specific dynamic quality, the students were variously asked to state why they had either resolved or not resolved the problems in their local environments associated with the activities. From their responsive characteristics it was possible using the indicators in Appendix B to determine if they possessed the dynamic quality or not. The students were said to have developed the dynamic quality if they participated

in all the environmental activities identified for the dynamic quality.

All the responses were recorded on the interview schedules and where the students accepted, these were tape-recorded and transcribed later. The interview transcripts were prepared and analyzed on a daily basis to allow the researcher get clarifications and to fill the gaps in the data before leaving the site.

Data Analysis Plan

Qualitative data analysis was done which continued during and after fieldwork. The responses on the interview schedule obtained from each site were examined and coded in relation to students' participation in environmental action. For the aspects dealing with dynamic qualities each response was matched with indicators of dynamic qualities to determine the quality expressed. From the categories frequencies were computed and percentages determined. Summary tables were then prepared for the purpose of data presentation and interpretation. Data were also presented verbatim to illustrate the common responses, where necessary.

RESULTS

The results presented in this section represent the common characteristics of secondary school students' participation in environmental action. These characteristics are grouped under the following broad environmental action dimensions:

- Environmental activities
- Mode of action
- Dynamic qualities.
- Environmental Activities

In this first task the students were required to state whether they frequently participated in all the four environmental activities in each broad category in the school, community and home environments. The students' responses were summarized as indicated in Figures 1-4.

From the figures it is clear that while the students participated in all 16 activities contained within the four broad categories, the proportions are very low considering the compelling significance of improving the quality of their local environments. On the average, only 42.5% participated in the activities while at school, 16.9% at their homes and 5.3% in the community surrounding the school. However, it is interesting to note that a greater proportion of the students tended to concentrate their efforts on controlling visual pollution and improving environmental health and safety in their school environments. This is related to the obvious emphasis by the school authorities on keeping the school premises clean and safe.

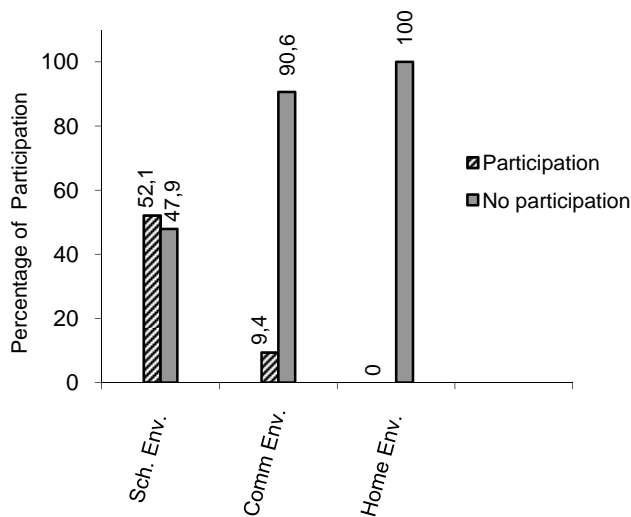


Figure 1. Proportion of students frequently participating in controlling visual pollution in local environments (N=272).

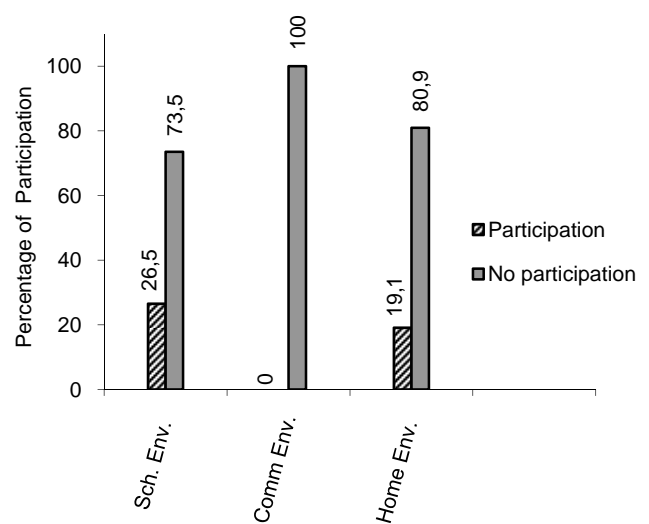


Figure 3. Proportion of students frequently participating in improving environmental aesthetics in local environments (N=272).

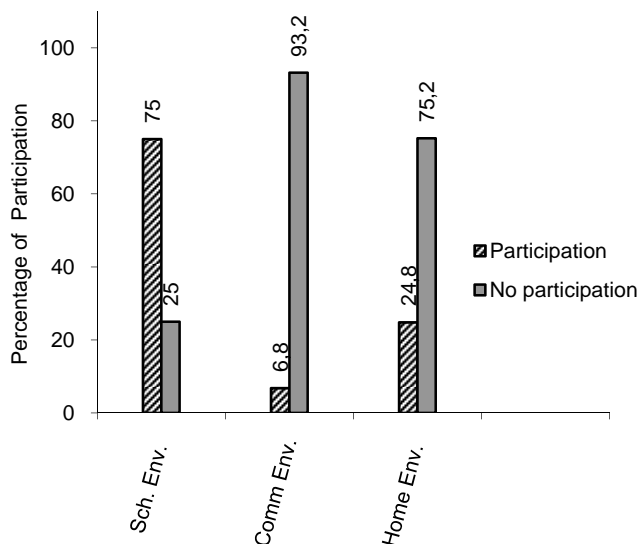


Figure 2. Proportion of students frequently participating in taking environmental health / safety measures in local environment (N=272).

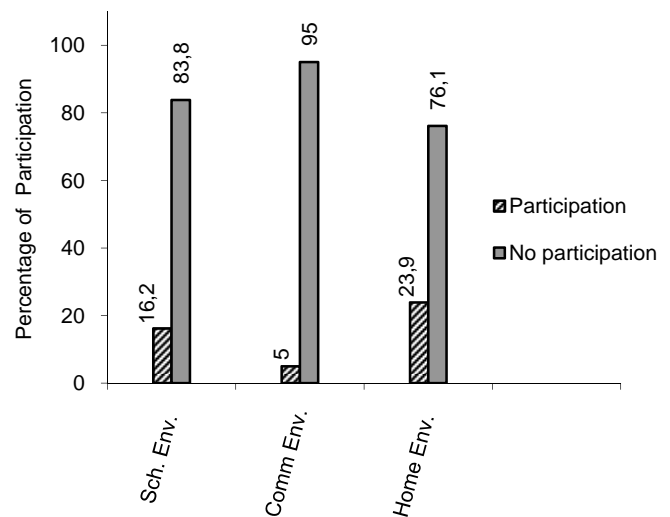


Figure 4. Proportion of students frequently participating in conserving environmental resources (N=272).

Students' participation in caring for their local environments greatly improves their perception of it (Kelley - Laine, 1991). But if this is to be done within the framework of teaching and learning in environmental education, the students should take the lead. These results show the contrary as less than half of the students participated to some extent in protecting and improving the quality of their local environments.

Mode of Environmental Action

This task required the students to state the circumstances in which they frequently participated in each of

the four broad categories of environmental activities (outlined in Table 2) in the school, community and home environments. Their responses were as summarized and presented separately in Tables 3, 4 and 5.

Table 3 indicates that while at school, the students participated in the activities mainly as part of routine manual work assignment (26.4%) and punishment (12.1%). Very small proportions did the activities either as club work (2.5%) or as part of the learning program (1.5%). Similarly in Table 4, only very few students (5.3%) participated in community environmental management. They participated exclusively through environmental based clubs, namely, Young Farmers' Club, environmental based clubs, namely, Young

Table 3. Mode of Students' Participation in Environmental Activities in School (N=272)

Environmental Activity	% Responses for each mode of participation					
	Punishment	Class Work	Routine Manual Work	Club Work	Personal initiative	Never
Controlling visual pollution	19.9	0.0	32.3	0.0	0.0	47.9
Taking environmental health/safety measures	20.1	0.0	54.9	0.0	0.0	32.1
Improving environmental aesthetics	8.2	3.5	14.8	0.0	0.0	73.3
Conserving resources	0.0	2.6	3.6	10.0	0.0	83.8
Average	12.1	1.5	26.4	2.5	0.0	59.3

Table 4. Mode of students' Environmental Action in Community (N=272)

Category of environmental Activity	% Responses of students carrying out activity as:						Total Action (%)
	Punishment	Class Work	Routine Manual Work	Club Work	Personal initiative	Never	
Controlling visual pollution	0.0	0.0	0.0	9.4	0.0	90.6	9.4
Taking environmental health/safety measures	0.0	0.0	0.0	6.8	0.0	93.2	6.8
Improving environmental aesthetics	0.0	0.0	0.0	0.0	0.0	100.0	0.0
Conserving resources	0.0	0.0	0.0	5.0	0.0	95.0	5.0
Average	0.0	0.0	0.0	5.3	0.0	94.7	5.3

Table 5. Mode of Students' Participation in Environmental Activities at Home (N=272)

Category of environmental Activity	% Responses of students carrying out activity as:						Total Action (%)
	Punishment	Class Work	Routine Manual Work	Club Work	Personal initiative	Never	
Controlling visual pollution	0.0	0.0	0.0	0.0	0.0	100.0	0.0
Taking environmental health/safety measures	0.0	0.0	6.5	0.0	18.2	75.3	24.7
Improving environmental aesthetics	0.0	0.0	7.7	0.0	11.4	80.9	19.1
Conserving resources	0.0	0.0	11.6	0.0	12.3	76.1	23.9
Average	0.0	0.0	6.5	0.0	10.5	83.1	17.0

Farmers' Club, Wildlife Clubs of Kenya, Kenya Red Cross Association and Kenya Scouts and Girl Guides Associations. In their home environments (Table 5) the students performed the activities primarily through their own initiative (10.5%) and routine manual work assignment by their parents and guardians (6.5%). Interestingly none of the students reportedly did the activities at their homes through punishment.

Dynamic Qualities

Data from the students' responses indicate that their day today experiences and actions in their local environments resulted in the development of dynamic qualities. Tables 6 and 7 are summaries of the students' key responses revealing these dynamic qualities (basic and integrated respectively) as expressed in their feelings, concerns, ideas and actions relating to the various environmental problems in their local environments. The proportions of the students who developed the dynamic qualities are summarized in Table 8. From Table 8 it is clear that less than 50% of the students developed all the dynamic qualities. On the overall only 14.0% developed the qualities while 86.0% did not. In terms of individual dynamic qualities, the responsive characteristics are more revealing as outlined in the rest of this section.

(a) Showing Sensitivity to environmental quality

To establish if the students had developed this dynamic quality, they were asked if they were bothered by the attributes that adversely affected the quality of their local environments and if this recognition was based on informed awareness of visual pollutants (garbage, graffiti, cobwebs, derelict), environmental health and safety hazards (leaking roofs unhygienic environment, unsafe water), unaesthetic environment (lack of flowers, poor landscape, unkempt hedges and grass lawns) and un-conserved resources (trees, soil, and water). The students (48.5%) who demonstrated the possessions of the dynamic quality were fully informed on all these issues (see Table 6 and 8).

The rest of the students (51.5%) who lacked the dynamic quality also displayed a lack of understanding of the issues. For example, they indicated that since visual pollutants were temporary in nature they would just disappear on their own from the environment and that they did not change its nature.

(b) Monitoring one's actions in the environment

The students (10.3%) who demonstrated the development of this dynamic quality in them frequently and voluntarily monitored all their actions that caused changes in the environment with a view to correcting them. The students were members of environmental based clubs. The other 89.7% had not developed the dynamic quality and only participated in picking and

burning the litter and conserving water resources when they were coerced or told to do so (see table 6).

(c) Showing concern for environmental quality

Only 10.3% of the students who were members of environmental based clubs demonstrated that they had developed this dynamic quality. The students were disturbed by the degraded state of their local environment and voluntarily campaigned for its improvement and/or prepared a report to facilitate action by local authorities. The students exclusively acted through clubs and class work assignments. On the other hand, 89.7% who did not demonstrate the dynamic quality seemed not to identify the problems, or if they did, they were not concerned (See Table 6).

(d) Accepting and seeking responsibility for environmental action

The students who possess this dynamic quality are remorseful for their own and others degradation of the environment and therefore enthusiastically recognize the need for corrective action. They are guided by, and display a sense of, personal ethic in their actions. From this prescription, only 10.4% of the students who were members of environment – based clubs possessed the dynamic quality. The students who did not express the dynamic quality usually gave unconvincing reasons for their non-participation such as gender, culture, lack of authority and apathy (see Table 7).

(e) Exercising initiative in conserving / improving environmental quality

The main indicator for this dynamic quality is the ability to identify problems and voluntarily improve the quality of the environment without being forced or told to do so. On the average only 15.5% of the students who were also members of clubs demonstrated the possession of the dynamic quality and were exclusively identified in those who acted on their own in their home environments. Those who participated in conserving environmental quality on their own initiative tended to have a clear understanding of the issues at hand and were members of environment based clubs. Those who lacked the dynamic quality gave defeatist reasons for not participating in the activities such as lack of authority from school administrators and parents (See Table 7).

(f) Showing commitment to Environmental action

In this task the students were asked to say what really propelled them to voluntarily and frequently participate in conserving environmental quality. The students (10.3%) who had developed the dynamic quality tended to consciously plan, and show a strong and continuous desire, to protect and enhance environmental quality. This was done primarily through club assignments and personal initiative. Those who lacked the dynamic quality blamed their non-action on one barrier or the other such as gender and lack of authority (see Table 7).

Table 6. A Summary of Common Responsive Characteristics and Relevant Basic Dynamic Qualities Acquired by Students

Categories of environmental activities	Task	Common Responsive Characteristics	Dynamic Quality
<p>Visual pollution control:</p> <ul style="list-style-type: none"> - garbage, graffiti, cobwebs, derelict <p>Improving environmental aesthetics:</p> <ul style="list-style-type: none"> - flowers, hedges, lawns 	<p>Are these regarded as pollutants in your school/home environments? Why do you say so? Would you need to remove them and why?</p> <p>How would you describe environment with lack of flowers, unkempt grass and hedges? How do these affect your school/home environment?</p>	<p>...graffiti, cobwebs, garbage... all make environment untidy... that is why I usually remove them from our homestead...</p> <p>... I don't need to remove litter, graffiti, cobwebs... these things are temporary... some will rot away, others will fade... they will just disappear... they don't affect our environment...</p> <p>...flowers, well trimmed grass and hedges are good... I feel satisfied when I look at them... they make environment beautiful...</p> <p>...it is not necessary to have flowers, lawns and hedges... they give unnecessary work instead of concentrating on our studies...</p>	<p>Showing sensitivity to environmental quality</p> <p>Not showing sensitivity to environmental quality</p> <p>Showing sensitivity to environmental quality</p> <p>Not showing sensitivity to environmental quality</p>
<p>Visual pollution control:</p> <ul style="list-style-type: none"> - litter, conserving resources such as water 	<p>Do you continuously recognize the way you change the environment through litter disposal and usage of water both in school home? Please explain...</p>	<p>...in school we are punished for throwing litter anywhere... I now find it bad to throw litter anyhow... I always throw it in the litter bin... at home we throw rubbish in compost pit...</p> <p>Water is scarce in school and even at home... I store water in bottles (drinking) and buckets for use...</p> <p>...I put litter in bin because I don't want to be punished...</p> <p>Water is difficult to get... that is why we keep in buckets... sometimes I don't keep so I borrow ...</p>	<p>Monitoring one's actions in environment</p> <p>Monitoring one's action in environment</p> <p>Not monitoring one's actions in environment</p>

<p>Any of the four categories</p>	<p>Are there any studies you have carried out on your own on any environmental issue and on which you keep relevant information? Please elaborate</p>	<p>...I'm interested in water matters because it is important but scarce... I read about water in Encyclopaedia...in future I want to be water engineer... management.</p> <p>...I have read about soil erosion and conservation...I keep pictures from magazines and newspapers about it.</p> <p>...I keep information on how to plant/care for trees...I hope to start my tree nursery...</p> <p>...you can't just read or study until the teacher tells you...I read only story books on my own...</p> <p>...I personally organized a campaign and we cleared garbage and cleaned premises in our local hospital...it was untidy and the lives of the patients were at risk... this was in line with the objectives of our club...</p>	<p>Showing interest in environmental conservation/management.</p> <p>Not showing interest in environmental conservation</p> <p>Showing concern for environmental quality.</p>
<p>Visual pollution control</p> <ul style="list-style-type: none"> - cobwebs, garbage <p>Improving Environmental aesthetics:</p> <ul style="list-style-type: none"> -planting/caring for flowers. <p>Environmental health/safety measures:</p> <ul style="list-style-type: none"> - cleaning/repairs. <p>Conserving resources:</p> <ul style="list-style-type: none"> - planting trees 	<p>Have you ever been disturbed/bothered by the presence of cobwebs in roof, litter in compound, dirt in class/living room, empty spaces without trees/flowers in residential premises, and leaking roofs and worn out walls in buildings?</p> <p>Have you ever taken any corrective measures? Please elaborate.</p>	<p>...I have not seen any serious problem in the community (the same public hospital nearby)...if there is any problem there are people out there employed who should solve it...</p> <p>...teachers have not told us to be repairing leaking roofs or planting trees and flowers...when we just do that...otherwise workmen should plant trees and flowers here in school, it is their work...</p> <p>...we have no permission to plant flowers or trees in school; even at home parents may not like flowers...also as a girl, I m not allowed to plant trees or repair leaking roofs...</p>	<p>Not showing concern for environmental quality</p>

Table 7. A Summary of Common Responsive Characteristics and Relevant Integrated Dynamic Qualities Acquired by Students

Categories of environmental activities	Task	Common Responsive Characteristics	Dynamic Quality
Environmental health/safety measures: -repairing roofs -clearing household gear/toilets Conserving resources: - water visual pollution: - garbage	Have you ever developed a habit or belief that motivates you to conserve or improve your local environment from time to time particularly in cleaning living rooms, toilets, and household gear, burning litter and repairing leaking roofs? Please elaborate	...the home must be clean... I always ensure that the living rooms and the courtyard are cleaned every time I am at home... at first my parents did not like this... that the work should be done by females, not males... but now they are used... ...I cannot repair a leaking house at home... we girls are not allowed to carry out most of the activities meant for men... the parents don't allow it... as for toilet in school, we girls do it as part of duty roster...	Accepting and seeking responsibility for environmental action. Not accepting and seeking responsibility for environmental action.
Environmental health/safety measures: - repairing roofs boiling water	Have you ever conserved or improved the environment on your own without being told to do so, particularly in terms of repairing leaking roofs, boiling drinking water, cleaning toilets and household gear, planning and caring for trees an flowers, conserving water, and pruning hedges?	...I planted hedges at home to make the compound neater and to create a habitat for beautiful animals like birds... my parents did not like this but I convinced them... they believed hedges attract snakes and snails... but since I care for the hedges they no longer fear... ...I did not plant hedges at home ... parents do not like them... they say these attract dangerous animals like snakes and foxes... you can only carry out activities in the home if the parents tell you to do so... ...we don't boil the water for drinking... we have never had any problem with it although it comes from our well...	Exercising initiative in conserving/improving environmental quality Not exercising initiative in conserving/improving environmental quality.

<p>Visual pollution control:</p> <ul style="list-style-type: none"> - cobwebs, garbage, graffiti <p>environmental, health/safety measures:</p> <ul style="list-style-type: none"> - repairing roofs - boiling water <p>Cleaning households' gear/toilets/living rooms.</p>	<p>Do you plan for and continuously carry out environmental management activities? Is there any external force in your motivation? Is this reflected in the following:</p> <ul style="list-style-type: none"> - clearing cobwebs, garbage and graffiti, repairing leaking roofs, cleaning toilets and living rooms, boiling water for drinking, cleaning households gear, planting and caring for trees and flowers and conserving water and soil? 	<p>....when I am at home I always make sure that I clean and dry all the household gear and keep them safely...at least three times a day....This prevents diseases causing germs from contaminating the gear...the plant is usually in my head everyday... I learnt this in home science.</p>	<p>Showing commitment to environmental action</p>
<p>Improving environmental aesthetics:</p> <ul style="list-style-type: none"> - Planting/caring for trees and flowers <p>Pruning hedges</p>		<p>....Cleaning household gear is the work of girls and women...The gear is usually cleaned by my sisters or mother...unless they are sick or away, I can t wash... I have never been taught how to do this....</p>	<p>Not showing commitment to environmental action</p>
<p>Conserving resources:</p> <ul style="list-style-type: none"> - water soil 		<p>...in planting trees, or flowers...even in preventing soil erosion...we in our club...that is Scouts and Girl guides Association...we must plan what we want to do before we act...</p>	<p>Showing commitment to environmental action.</p>
<p>Any of the four categories</p>	<p>Is there any idea of your own that you came up with that helped you conserve or improve your local environment? Please elaborate</p>	<p>.... I read a book on how to improve the home environment... this was part of the of the project plan for our club... but since we did not continue with the project plan for our club... but since we did not continue with the project I decided to do it at our home... I landscaped our compound...it is beautiful...</p> <p>.....unless the teacher gives an assignment or the parents give you some work at home, you can't just start doing your own thing....we also don't have the time for things not in the syllabus...</p>	<p>Showing independence of thought and action in environmental action.</p> <p>Not showing independence of thought and action in environmental action.</p>

Table 8. Summary of Results Showing Dynamic Qualities Acquired by students

Dynamic Quality	% Response (N=272)		
	Dynamic quality demonstrated	Dynamic quality not demonstrated	Total (%)
1. Showing sensitivity to environmental quality	48.5	51.5	100
2. Monitoring one's action in relation to environmental quality	10.3	89.7	100
3. Showing concern for environmental quality	6.2	93.8	100
4. Showing interest in environmental management	10.0	90.0	100
5. Exercising initiative in conserving environmental quality	15.5	84.5	100
6. Showing commitment to environmental action	10.3	89.7	100
7. Showing independence of thought and action in environmental action	0.7	99.3	100
8. Accepting and seeking responsibility for environmental action	10.4	89.6	100
Average	14.0	86.0	100

(g) *Showing independence of thought and action in environmental action*

The students who possessed this dynamic quality demonstrated original ideas in selecting environmental action projects or tasks and strategies and in voluntarily implementing the strategies. Only two students (0.7%) who were members of the Red Cross society of Kenya demonstrated that they had developed the dynamic quality. The students landscaped their homes to improve environmental aesthetics. The rest of the students (99.3%) did not display such originality in changing the environment (see Table 7).

(h) *Showing interest in environmental conservation*

The students who possessed this dynamic quality tended to display an interest in environmental conservation by carrying out independent studies and/or frequently reading about or keeping materials about the environment. In this regard 10% of the students kept up to date information on water and soil conservation as well as information on planting and caring for trees. All students except one were members of environment related clubs (see Table 6).

DISCUSSION

Several important observations are apparent about the manner in which the students participated in

protecting and improving the quality of their local environments. First, the students participated majorly because they were coerced into environmental action particularly in their school environment. If the objective of the school authorities was to achieve a quality environment, this strategy was admissible. But it was not admissible if the students were also expected to develop a positive commitment to the protection and enhancement of environmental quality.

Second, while a very low rate of students' participation was experienced, the role of clubs in this process, particularly at community level, is worth noting. The current view as posited by Hart (1997) that environmental clubs have the potential of positively involving more students in the process of conserving the quality of their local environments than the regular school program is thus supported.

Third, it is noteworthy that out of the 16 activities, the students participated in only three in their school environment as part of the learning process. Thus practical work was not the focus of learning about environmental issues in the schools.

Fourth, students participated in environmental action through their own initiative primarily while at home rather than when they were at school. This seems to indicate that students had more freedom to exercise their initiative at home than at school. The explanation

to this seems to lie in the contention that schools operate within a fairly rigid time frame. Consequently, teachers find it easier to assign students to work on environmental tasks rather than involving them in identifying problems themselves and collaborating with them in finding solutions. This approach obviously discourages students from developing a genuine concern for the environment as they see the tasks as a source of trouble rather than of opportunity for fruitful participation.

Fifth, there was some distinction in the distribution of activities between boys and girls, particularly at home. This is indicative of the specialized role of men and women in environmental action in our society. Whereas this may be acceptable in most African traditions, the practice denies both boys and girls access to very useful experiences and skills. The essence of environmental education should be to bridge this gap. Environmental action should be based on students' abilities and interests rather than on gender.

Sixth, the way students perceived the attributes affecting environmental quality seemed to affect their participation. For example, the students did not control visual pollution apparently because they considered pollutants as temporary and of no significant change on the environment.

A recent model promulgated by Hart (1997) uses an eight-rung ladder as a metaphor to illustrate the different degrees of initiation and collaboration students can have when participating in environmental action projects or tasks. In the model, the overwhelming use of punishment and routine manual work assignment by the teachers to accomplish environmental action does not constitute genuine participation on the part of the students. The two modes of environmental action could be represented by the fourth-rung of the ladder where the students participate but they are not informed. This is because the projects in which the students are involved are designed simply to use students as free labour to achieve some of the environmental objectives. The projects are not usually used as part of an exercise to encourage students' critical reflection on the causes of the environmental problems (such as littering) and how they might influence the adults to also change their behaviour towards the environment. Genuine participation should be such that even if environmental projects are designed by teachers the students are encouraged to understand the process, are consulted, and have their opinions treated seriously. It is a learning process whose primary objective is to develop in the students' abilities necessary for informed environmental action. Moreover, if not properly executed, the model shows that even these environmental action projects expected to be accomplished through school learning and clubs may

just carry simple messages from top down and have only a short – term impact on the students.

The few students in this study (an average of 14.4%) who had developed the eight dynamic qualities showed a clear tendency to conserve environmental quality than those who lacked such qualities. They also acted on the environment on their own volition without being coerced or directed to do so. More significantly, all members of the Kenya scouts and Girl Guides Association, wildlife clubs of Kenya, Red Cross association of Kenya, and Environmental clubs developed all the eight dynamic qualities.

The students who lacked dynamic qualities variously displayed traits that suggested that some barriers hindered effective development and functioning of the qualities. The first category of barriers ranged from students' lack of time, opportunity and authority on one hand and their gender, cultural values and apathy towards environmental action on the other. They appeared to pass the buck with regard to solving environmental problems. They would say “– the teachers did not tell us to do that –”. While these barriers are genuine and difficult to overcome, only one determined to attain optimum environmental quality would attempt to overcome them. Such a student should have developed requisite dynamic qualities that would drive him or her to participate in the needed environmental action: exercising initiative and independence of thought; showing concern; realizing individual responsibility; and showing interest and commitment with regard to environmental enhancement.

The second category of barriers hinged on students' lack of awareness and misconception of certain environmental phenomena that affected environmental quality. This greatly influenced their lack of two dynamic qualities, namely showing sensitivity to environmental quality and monitoring one's actions in the environment.

It is evident that environmental education had neither erased the misconceptions nor eliminated the barriers that affected the development of dynamic qualities in the students. The results confirmed that dynamic qualities develop in the students if the later are exposed to practical activities. For dynamic qualities can only be promoted where they are needed and where opportunities exist for becoming active (Posch, 1991). Where such strategies are not used students are not in the habit of positively acting in the environment on their own; they can only be told what to do or coerced to do the needful as the results indicated. Thus possession of dynamic qualities seems to provide the drive to carry out environmental action. This observation is supported by the “motivation theory of action” as postulated by Edward Tolman and Kurt

Lewin (Hill, 1985; Birch and Veroff, 1966). The theory suggests that people act positively on the environment if they are urged by their deep beliefs and attitudes that act as a drive.

CONCLUSION

In this study, secondary school students were questioned about their participation in environmental action. This was done through use of situations prevalent in their home, community, and school environments. The situations selected were those that made it possible to depict the students' mode of environmental action and the dynamic qualities which they had developed. The most significant observation about students' environmental action revealed by this study are as follows:

Secondary school students tended to sustain or improve the quality of the environment by conserving local resources, controlling visual pollution, and improving environmental health, safety and aesthetics.

Although only very few students attempted to sustain or improve the quality of their local environments a higher proportion did that while at their schools than while at their homes. However, the students through punishment and routine manual work assignment while at school did many of these activities. The smaller proportion that participated in environmental action while at their homes exercised their initiative in carrying out environmental improvement than while at school.

Most students rarely ventured into the community surrounding the school to assist in protecting and improving the quality of the environment. The few who assisted did that through club work.

The students who participated in environmental action on their own volition or through class or club assignments appeared to have developed one or more of the eight dynamic qualities.

The students who did not participate in environmental action, or those who participated through punishment and routine manual work assignment, did not seem to have developed the dynamic qualities.

The rather low level of students' participation in environmental activities revealed in this study should be a matter of concern to environmental educators. The results are not surprising since most students indicated a lack of environmental awareness and dynamic qualities that are a prerequisite to environmental action. For participation in environmental management demands that students be equipped not only with personal knowledge of the environment, leading to affection, but also dynamic qualities that can come only from practicing these attributes in real environmental activities (Emmons, 1997). Perhaps of greater interest is

the fact that only very few students participated in environmental action through their own personal initiative than through other modes of participation. It is also instructive that this was only done by the students while at their homes. This could be attributed to schools which emphasized self-restraint and doing what one is told. This made the students dependent and overly restrained, thereby killing their desire to learn and work independently. These findings remind us that whatever structures for participation are established they must allow flexibility for students to explore and develop their actions in the environment in ways consistent with their own abilities, interests and cultures (Rickinson and Sanders 2005; Dymont and Reid, 2005; Emmons, 1997; Lee Smith and Chaundry, 1990).

The results have revealed that only through genuine participation can students develop dynamic qualities. Most students had not developed dynamic qualities since they were not given opportunities to define situations and problems, to seek and accept responsibility, to develop initiative and self-reliance and to monitor themselves on the basis of reflected values in their local environments. If a primary goal of environmental education is to be the development of dynamic qualities in the students then much effort and research must be directed toward establishing effective means for achieving this end. If dynamic qualities of students are to be translated into responsible social behaviour (environmental action) it would appear that these qualities should be deeply rooted and based upon environmental knowledge and awareness, and experienced through genuine participation in their local environments rather than superficially "learned" or instilled by coercion. It is imperative that environmental education curriculum should focus on practical problems of living within the environment which are experienced by students as well as problems and issues related to their own actions (Rickinson and Sanders, 2005; Malone and Tranter, 2005). The positive environmental action model proposed by Emmons (1997) and the operation – environment model (Toili, 1996) provide relevant framework in which action research is employed to facilitate this kind of learning. Environmental action by the students realized through decree and coercion is thus pedagogically unsound. However this should be predicated upon students dynamism (development and use of dynamic qualities) rather than on coercion or limitless orders and decrees by school authorities and parents. This kind of action is voluntary (self-determined) based on good habits of planning, decision-making, reflection and aimed at environmental improvement and can only be achieved through a well coordinated environmental education programme.

APPENDIX A: INTERVIEW SCHEDULE FOR STUDENTS
SECTION A

1. For each of the four broad categories of environmental activities, indicate those you have frequently participated in (i.e. at least two days or two hours in each week for the past four or more months) in each of the school, community and home environments.

Category of environmental activity	Type of Environment		
	School	Community	Home
Controlling visual pollution: - clearing cobwebs, garbage, graffiti and derelict.			
Taking environmental health/safety measures: - Slashing grass, cleaning/repairing dormitories/classrooms/residential premises, boiling water, cleaning toilets/households gear			
Improving environmental aesthetics: - Planting flowers, caring for flowerbeds, landscaping, pruning hedges.			
Conserving resources - Planting trees, caring for trees, conserving soil and water			

2. (a) For each activity listed in (1) above state the circumstances under which you frequently participated in the activity at school, community or home environment i.e. by punishment (P) personal initiative (PI), school learning (L), routine manual work (MW) club work (C). If you did not participate in the activity, say never (N). (probe for more information)

Category of environmental Activity	Mode of Environmental Action																	
	School Environment						Community Environment						Home Environment					
	P	PI	L	MW	C	N	P	PI	L	MW	C	N	P	PI	L	MW	C	N
Controlling visual pollution: - Clearing cobwebs, garbage, graffiti and derelict.																		
Taking environmental health/safety measures: - Slashing grass, cleaning/repairing dormitories/classrooms/residential premises, boiling water, cleaning toilets,/households gear																		
Improving environmental aesthetics: - Planting flowers, caring for flowerbeds, landscaping, pruning hedges.																		
Conserving resources: - Planting trees, caring for trees, conserving soil and water																		

- (b) If you participated through club work, name the clubs, and if through classroom activities, name the subjects and the type of activities.

SECTION B

3. Showing Sensitivity to Environmental Quality:
 - (a) Which of the following in your school/home environment act as pollutant? (garbage, graffiti, cobwebs, derelict). Why do you say so? Would you need to remove them? Why?
 - (b) How would you describe a school/home environment without flowers, pruned hedges and untrimmed grass lawns? Do these situations affect the home/school environment? Please explain.
4. Monitoring one's Action in the Environment
 - (a) Do you continuously recognize the way you change the environment through disposal of litter and unsparing use of water in your school or home environment? Please explain your response.
 - (b) Have you carried out any corrective measures as a result of realizing your actions? Please explain.
5. Showing concern for environment quality.
 - (a) Have you ever been bothered or disturbed by the presence of the following things in your school/home environment?
 - Cobwebs in roofs/corners of buildings
 - Litter/garbage carelessly discarded
 - Leaking roofs/worn out walls
 - Dirty floors of living rooms/classrooms/toilets
 - Empty premises without flowers/trees
 - Stunted trees / flowers
 - (b) Have you ever taken action to rectify any or all of the above situations? Please explain.
6. Showing interest in environmental management
Are there any environmental issues/problems on which you have carried out your own studies and on which you keep relevant information? Please elaborate (you may need to look at the records).
7. Accepting and seeking responsibility for environmental action
 - (a) Have you ever developed a habit/belief that motivates you to conserve or improve your school/community/ home environment from time to time in terms of the following: cleaning toilets/living rooms/classrooms, repairing leaking roofs and worn out walls, cleaning household gear, conserving water, collecting and binning litter.
 - (b) Why do you act the way you do? Please elaborate.
8. Exercising initiative in conserving/improving environmental quality
Have you ever conserved or improved the environment on your own without being told to do so? Is that reflected in the following in your school/home/community environments? Please elaborate:
 - Cleaning toilets, living rooms, classrooms, households gear
 - Repairing leaking roofs/ worn out walls
 - Boiling water for drinking
 - Conserving water
 - Planting and caring for trees/flowers
 - Pruning hedges.
9. Showing commitment to environmental action
Do you plan for and continuously carry out environmental management activities? Is there any external force in your motivation to improve your home/ school/community environment? Is this reflected in the following activities? Please elaborate.
 - Clearing cobwebs, garbage, graffiti and derelict
 - Repairing leaking roofs/worn out walls
 - Clearing household gear/living rooms/classrooms
 - Boiling water for drinking
 - Planting and caring for flowers/trees/hedges
 - Conserving water and soil.
10. Showing independence of thought action in environmental action
Is there any idea of your own that you came up with that helped you conserve or improve your school/home/community/environment? Please elaborate.

APPENDIX B: SOME INDICATORS OF DYNAMIC QUALITIES

1. Showing Sensitivity to environmental quality:
 - Shows sensitivity to the effects of one's actions and those of others on the environment.
 - Aware of the conditions of the built, social and natural environment and how they have been brought about.
2. Monitoring One's actions in relation to environmental quality
 - Frequently and voluntarily monitors ones actions that cause changes in the environment with a view to correcting them.
3. Showing concern for environmental quality:
 - Disturbed by or appreciates what is seen in the environment.
 - Forwards report of state of environment to relevant authorities for action and/or campaigns actively for environmental conservation.
4. Accepting and seeking Responsibility for Environmental Action.
 - Remorseful for one's/others' degradation of the environment and enthusiastically recognize the need for corrective action.
 - Guided by, and display a sense of, personal environmental ethic and therefore unwilling to make changes that will degrade the environment; will always try to do the correct thing – e.g. binning litter instead of throwing it any how.
5. Exercising initiative in conserving environmental quality
 - Demonstrates ability to identify problems in the environment and to voluntarily act without being forced or told – e.g. designing and landscaping the environment to improve its quality.
6. Showing commitment to environmental action
 - Consciously plans, and shows a strong and continuous desire, to protect and enhance environmental quality – e.g. recycling materials instead of wasting them, vigilant about the changes in the environment and constantly taking appropriate action and using resources sparingly.
7. Showing independence of thought and action in environmental action.
 - Demonstrates original ideas in selecting environmental action projects or tasks and the strategies to be used and in voluntarily implementing the strategies.
 - Forms reasoned opinions and develops balanced judgments about environmental situations by looking for relevant information.
8. Showing interest in environmental conservation.
 - Demonstrates an interest in the environment by carrying out independent studies and/or frequently reading about or keeping materials about the environment – e.g. trying to find out why the environment is the way it is, asks questions about environmental phenomena, displays an aesthetic appreciation of the environment and checking out certain things in the environment to see their progress.

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