Dynamic Reflections of Environmental Education towards Educational Institution

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Abstract
The study governs the dynamic reflections of Environmental Education in the government and private educational institutions at Chittagong urban area in Bangladesh that was conducted in 40 schools over the period of 6 months. The study reflects the standards familiar, the consequences measured, and the achievements realized since the dynamic path mentioning the current status of environmental education in Chittagong City schools to look as a case study in regional issue. Primary data obtained were through field survey while secondary data collected from diverse sources for document analysis. Eccentricities of effective environmental education were recognized based on a literature review and interviews with teachers, students, parents and relevant bodies. Existing policy on environmental education in Chittagong City Areas, though helpful, is generally not followed since most effective bodies are unaware of it. The findings demonstrated that attention and environmental consciousness significantly predicted in educational institutions. Overall, it was concluded that environmental education in the Chittagong City Schools needs some augmentations on the priority based. The study suggests future research trajectories of a scientific alternative dynamic approach to reflect methodological agenda and recommendations on ways to further integrate educational instruments towards required institutions.

Keywords: Environmental Education, Reflection, Institution and Chittagong.
1. INTRODUCTION

Environmental Education (EE) is education that focuses on the relationship between humans and their environment (Arai & Sprules, 2001). EE is the systematic curriculum development, scientific action-oriented programmes, and empirical education, enthusiastic to environmental conservation, ecological field exposures, sectoral integration, and academia effective trainings. Education is the great engine of personal development which involves in productivity and creativity to the present and upcoming generations (The Bangladesh Observer, 2006). This education is dynamic for promoting sustainable development and improving the capacity of the people to address environment and development issues. While basic education can provide the underpinning for any environmental and developmental education, the latter needs to be incorporated as an essential part of learning. Both formal and non-formal education is indispensable to changing people's attitudes so that they have the capacity to assess and address their sustainable development concerns. It is also critical for achieving environmental and ethical awareness, values and attitudes, skills and behavior consistent with sustainable development and for effective public participation in decision-making. Environmental education enhances critical thinking, problem solving, and effective decision-making skills, and teaches individuals to weigh various sides of an environmental issue to make informed and responsible decisions. Environmental Education (EE) does not advocate a particular viewpoint or course of action. The EE is a process in which individuals gain awareness of their environment and acquire knowledge, skills, values, experiences, and also the determination, which will enable them to act - individually and collectively - to solve present and future environmental problems. The existing information, education and mobilization processes have also an important role in the evolution of environmental management around the world (Romero, 1995). EE is a complex process, covering not just events, but a strong underlying approach to society building as a whole. Education is commonly perceived as a one-way flow of information, usually in educational institutions, especially schools. However, environmental education can be two-way communication with full participation and learning by people of all ages. Environmental education should not be confined to schools, but is an important tool for institutional managers, civil servants, community groups and NGOs alike, enabling them to implement policies to protect the environment (Van Hemert, Wiertsema, & van Yperen, 1995).

In Chapter 36 of Agenda 21 (Promoting Education, Public Awareness and Training), several objectives were outlined including the achievement of environmental and development awareness in all sectors of society on a world-wide scale. This objective is meant to be realized through the accessibility of environmental and development education, linked to social education, from primary school age through adulthood to all groups of people (UNCED, 1992). We believe that all people have the right and that this enrichment will be what drives our society to become more sustainable. In assessing the curriculum and classroom practices in National Curriculum Textbook Board (NCTB), the issue of whether scientific uncertainty and different perspectives were being covered in the classroom was specifically addressed. It was felt that this specific focus was important because the nature of science, and especially the science surrounding environmental issues, is constantly shrouded in uncertainty. To understand many of the problems surrounding environmental issues, one must be sure to understand the complexity and uncertainty behind the science. Understanding different perspectives is also an important tool in assessing information coming from various sources, and is of inherent importance in deciphering environmental problems. Some have emphasized the difficulties involved in solving environmental problems because of scientific uncertainty (Costanza, & Cornwall, 1992). It is important for the young and old alike to understand these difficulties in order to be able to make responsible decisions about environmental issues. From previous experience and conversations with teachers of grades 6, 7, and 8 (11 years, 12 years and 13 years
old respectively), it was felt that children of this age group are capable of tackling these complex problems even though it requires a high level of critical thinking. To understand and solve environmental problems this high level of critical thinking is necessary, and it is important that this be emphasized as soon as the children are able to handle it. It was felt that these issues were not commonly being addressed at this level, and there was some interest as to why this was the case and how they could be better incorporated into the classroom.

The research defines some of these programs and makes recommendations for strengthening environmental education at different educational institution of Chittagong city area in Bangladesh. It highlights the need to deploy environmental expertise in public and private sector management systems as the focus of government policy in Bangladesh matures from a short-term focus on self-sufficiency to the pressing issues of sustainability within the environmental opportunities and constraints offered by the environment. Chittagong city is a sea-port and commercial capital which contributes different educational institution including environmental education, such as universities, colleges and schools. From these educational institutions to justify how contribute environmental education among the students, teachers and other participants and overcome environmental issues.

2. METHODOLOGY

In this research mainly historical methodology has been followed. Moreover scientifically aspects of natural environment with distinguished features of its structure, curriculum shall be analyzed and reviewed. In respect of source–materials of research in this paper mainly considered the references in the official and demo-official records, published reports, newspapers and journals and various private organizations reports to be related in environmental education. Secondly, some of the useful literatures related to environmental education in Bangladesh written by prominent scholars have been taken to compare, cross and justify against the objectives. The above mentioned source-materials have been collected in governmental and non-governmental and different university libraries in Bangladesh etc. We have also utilized modern technologies like internet, website, email etc. to collect facts and figures about our research field which was help us to reach a further-more accurate decisions and opinions. Feedback meeting carried out in order to share the research findings with the respondents and staffs to get their feedback suggestions and comments of environmental education during the organized interview through questionnaire.

3. RESULTS AND DISCUSSION

3.1. Dynamic Environmental Education

From the literature review and teacher interviews, it is apparent that there are a number of fundamental characteristics of effectively taught environmental education. Environmental education relates to the following parameters as shown in Table 1.

Table 1: Summary of fundamental characteristics of Dynamic Environmental Education

<table>
<thead>
<tr>
<th>Effective Environmental Education</th>
<th>Dynamic Reflection</th>
</tr>
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<tbody>
<tr>
<td>Interdisciplinary and included across all grades and subjects</td>
<td>Educational Motivation</td>
</tr>
<tr>
<td>Makes students aware of the positive impacts they are competent</td>
<td>Educational Leadership</td>
</tr>
<tr>
<td>Has quality resources and teacher education available</td>
<td>Education Quality Management</td>
</tr>
<tr>
<td>Encourages critical thinking and problem solving</td>
<td>Decision-making</td>
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</table>
The literature review exposed several important aspects of effective environmental education. Many of these aspects were consistently mentioned throughout the literature as being important uniqueness of effective environmental education. Effective environmental education can be best described as teaching and learning that reaches the goals of environmental education as it was previously defined. The findings of Pareek & Sidana, 1998; Patel, Patel, 1994; Pradhan, 2002; Pradhan, 1995 suggested that there exists significant difference in the environmental awareness level in relation to residential background. It also advocated frequent outdoor learning experiences to improve students’ attitudes and behaviors toward environmental issues. Special care must also be taken to ensure that a program is “flexible enough to accommodate the diverse physical, intellectual, cultural, and economic conditions that exist in every classroom” (Heeney, 1997). Atwood, (1998) found that in her own teaching, it is important to schedule frequent and cumulative activities that allow students to build knowledge and awareness towards environmental issues. Courtney-Hall & Rogers (2002) suggests that using “clarification and critical thinking approaches to moral education are crucial” to avoid training environmental converts. This emphasizes the need for the inclusion of critical thinking in environmental education programs. They found that there are four main components that teachers would include in a new effective environmental education program.

### 3.2. Presence of Environmental Topics

Because the Prescribed Learning Outcomes (PLO) is the only portion of the NCTB that has to be strictly followed, the curriculum assessment necessarily began with them. An initial scan of the NCTB seemed to reveal that only General Science and Social Studies contained any amount of environmental topics. The results of the questionnaire, however, indicated that a significant proportion of teachers are including environmental education in four subjects in the Figure 1.

![Figure 1: A significant proportion of Science, Social Studies, Mathematics, Agriculture Studies, Physical Education, Religion Studies, Music and Fine Art teachers include environmental education](image)

These eight subjects are General Science, Social Studies, Mathematics, Agricultural Studies, Physical Education, Religion Studies, Music and Fine Arts. Thus, these four subjects were assessed in detail. The PLOs were studied to see if any of them specifically mentioned any environmental topics. If the PLOs included environmental topics, the subject was further reviewed through the use of indicators. Within Music and Fine Arts throughout grades 6, 7, and 8, there was no mention of environmental topics in the curriculum. A varying amount of environmental education was included in Science and Social Studies over the grade range.

3.3. Indicators of Effective Environmental Education

The indicators of effective environmental education were based on the literature review of effective environmental education, interview results, the six principles found in the 2007 document Environmental Concepts in the Classroom, and the suggested guidelines for implementation found in Environmental Concepts in the Classroom. Seven indicators were chosen (in the Table 3). These are not necessarily all the components of effective environmental education; they were simply meant to act as indicators of effective environmental education. The Prescribed Learning Outcomes, Suggested Instructional Strategies, and the Finalized Learning Resources were studied for Science and Social Studies (the two subjects which included environmental topics in the PLOs) for grades 6, 7, and 8, and the number of each indicator found was counted. Some statements or activities could be calculated as more than one indicator if it encompassed more than one of these ideals.

Table 2: Seven indicators of Effective Reflection of Environmental Education

<table>
<thead>
<tr>
<th>Indicators of Environmental Education</th>
<th>Effective Reflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addresses scientific uncertainty</td>
<td>Environmental Awareness</td>
</tr>
<tr>
<td>Encourages critical thinking and/or problem solving</td>
<td>Environmental Research</td>
</tr>
<tr>
<td>Addresses the presence of different perspectives on environmental issues</td>
<td>Highlighted Environmental Research</td>
</tr>
<tr>
<td>Offers resources on environmental topics</td>
<td>Environmental curriculum development</td>
</tr>
<tr>
<td>Encourages hands-on experiential learning</td>
<td>Environmental Competition Programme</td>
</tr>
<tr>
<td>Emphasizes community-based environmental education, local issues</td>
<td>Stakeholders’ participation</td>
</tr>
<tr>
<td>Encourages an interdisciplinary approach</td>
<td>Environmental Policy and Co-management</td>
</tr>
</tbody>
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The results from the study of the National Curriculum Textbook Board (NCTB) for Science and Social Studies are summarized in Table 3 below.

Table 3: Comparison of the number of environmental topics in the PLOs and the number of each indicator present in the NCTBs for Science and Social Studies in grades 6, 7, and 8 (Indicator number corresponds to the seven defined indicators above).

<table>
<thead>
<tr>
<th>Subject</th>
<th># of Topics</th>
<th>Grade</th>
<th>Parameters Represent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1. 2.</td>
<td>3. 4. 5. 6. 7.</td>
</tr>
<tr>
<td>Gen. Sci-</td>
<td>1</td>
<td>6</td>
<td>0 0 0 6 1 1 0</td>
</tr>
</tbody>
</table>
In general, science covered more environmental topics over all the grades studied than social studies. This may be because environmental education is often still considered solely a science topic. In fact, when the questionnaires were being distributed and we were speaking to principals/head teachers, many of them would tend to focus only on the science teachers at the school. It had to be made very clear that we wanted all teachers to fill out the questionnaire and not only the teachers involved with science. This was consistent with the results received from the questionnaire. The participants were asked to rate the NCTB on how effectively they include environmental education for each subject, and the results from this question can be found in 3.4.

3.4. Assessment of Environmental Education in the Classroom

Environmental Concepts in the Classroom for Teachers introduces six principles for integrating environmental education into the classroom setting (in the Table 4).

Table 4: The six concepts that the Environmental Concepts in the Classroom document see as the basis of environmental education.

<table>
<thead>
<tr>
<th>Sl.no.</th>
<th>Principles for Integrating Environmental Concepts</th>
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<tbody>
<tr>
<td>1.</td>
<td>Direct experience is the basis of learning</td>
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<tr>
<td>2.</td>
<td>Responsible action is integral to, and a consequence of, environmental education</td>
</tr>
<tr>
<td>3.</td>
<td>Life on Earth depends on, and is part of, complex systems</td>
</tr>
<tr>
<td>4.</td>
<td>Human decisions and actions have environmental consequences</td>
</tr>
<tr>
<td>5.</td>
<td>Environmental awareness enables students to develop an aesthetic appreciation of the environment.</td>
</tr>
<tr>
<td>6.</td>
<td>The study of the environment enables students to develop an environmental ethic.</td>
</tr>
</tbody>
</table>

These principles are included in the National Curriculum Textbook Board of the curriculum for every grade and subject in Bangladesh in a half-page discussion entitled “Environment and Sustainability”. This is included in the figure: Cross-Curricular Interests of the packages. This inclusion is important and helpful; however, the principles are not related to specific subjects and topics, and that figure does not discuss benefits of integrating environment and sustainability themes, nor does it give examples of specific teaching methods or specific resources. The document includes suggested guidelines for the implementation of environmental education. These are practices that are meant to help with teaching and learning about the environment to be suggested guidelines for implementation environmental concepts in the classroom, viz. (i) Integration of traditional subjects or multidisciplinary approaches, (ii) Presentation of a range of perspectives, (iii) Currency, (iv) Multicultural perspectives, (v) The place of action, (vi) Both local and global perspectives, (vii) Hopefulness, and (viii) Humility.

It is seen as the Ministry of Education’s simple answer to including environmental education across the curriculum. Environmental educators feel that environmental education actually deserves a more thorough discussion throughout the curriculum. The assessment of environmental education in
the classroom was mostly based on the perspectives and insights of questionnaire respondents and interview participants. Of the 200 questionnaires that were distributed to CCA schools, 50 were returned. Of the teachers that responded to the questionnaire, a large proportion teaches Science, Agriculture Studies, Social Studies and/or Mathematics. However, it was encouraging to see that teachers from a wide range of disciplines responded to the questionnaire.

3.5. Incorporated environmental education in Teachers’ Lesson Plans

The median for this data was also monthly. Ideally, as has been suggested throughout the literature review, environmental education should be incorporated into the classroom daily. However, it is encouraging to note that the next largest proportion of the respondents said they incorporated environmental education "Weekly", which is significantly more frequent than "Monthly". The general consensus among all the interview participants was that environmental education should be interdisciplinary, frequent, and relevant—and the interview participants felt they were succeeding at this. As for the other teachers who were not interviewed, the interview participants did not seem to think that they incorporate environmental education into their classroom lessons in the same way.

![Figure 2: On average, environmental education is incorporated monthly in lessons](image)

The mentioned guidelines in the curriculum include not only the Prescribed Learning Outcomes and Suggested Instructional Strategies, which are the summary of the Environmental Concepts in the classroom document. The largest proportion of questionnaire participants, upon being asked the question "Of the environmental education you incorporate in your lessons, how much of it is based on the curriculum and how much is your own initiative?" appeared to be teaching environmental education based half from the curriculum and half from their own initiative. The only existing policy on environmental education currently in Bangladesh is the Environmental Concepts in the classroom document. Of the respondents who were aware of this document 40% found it somewhat useful, 30% were neutral on its usefulness, 20% found it not useful, and 10% had not read the document. Based on these results, it may seem that the policy is effective in helping teachers incorporate environmental education in their classrooms. However, it must be remembered that only 20% of the questionnaire respondents were actually aware of the existence of the document in the first place. The teachers who were aware of the document, but did not find it useful, commented that the document is focused only towards Science and Social Science and is irrelevant to other subjects,
although environmental education is a segment of science education of national education policy (MoEdu, 2017). In the Environmental Education, people’s participation and the role of State Government is being understood as passive participation (Bui, 2011).

The effectiveness of environmental education being taught in the curriculum directly relates to the effectiveness of the environmental education that is included in the classroom. However, as shown earlier, what is taught in the classroom does not always represent the curriculum guidelines. For the purposes of this study, it was necessary to do a separate assessment of the effectiveness of environmental education being taught in the classroom based directly on teacher’s responses to the questionnaire and interviews. Teachers were asked in the questionnaire about the frequency that they use certain techniques to help their students learn about the environment. They chose from lecturing in the classroom, showing nature videos, hands-on learning outdoors, exploring local issues, using role playing, having guest speakers, going on field trips, implementing practical conservation, fundraising for an environmental organization, and using an interdisciplinary approach. Based on the previously mentioned defining factors of effective environmental education, hands-on learning, exploring local issues, having guest speakers, implementing practical conservation, and using an interdisciplinary approach, are all important aspects of effective environmental education. While lecturing in the classroom, showing nature videos, fundraising, and field trips may be valuable components of environmental education, they do not define effective environmental education.

4. CONCLUSION

Environmental Education has obtained momentum but has not been able to make the quantum leap towards preventing, stopping and reversing environmental degradation although some of the reasons focused in the educational institutions in Chittagong City Areas (CCA). This study showed that although impact of environmental education is included in CCA curricula and classrooms, it is not necessarily taught frequently or effectively. For grades 6, 7, and 8, environmental topics are only included in the Science and Social Studies. Even within these two subjects, the inclusion of environmental education is weak. For example, the curriculum does not include many suggestions for effective instructional strategies or resource materials related to environmental topics. Our results indicated that lecturing in the classroom is still the most commonly used technique for teaching environmental topics. More effective methods involving experiential, community-based, and interdisciplinary learning are being used, but at a much lower frequency. Critical thinking is commonly encouraged in the classroom. However, other concepts that are considered important by teachers, such as the presence of different perspectives and scientific uncertainty, are not always taught in relation to environmental topics. While a policy on environmental education exists in Bangladesh, it is inadequate and not commonly used. Teachers who are inexperienced in environmental education lack guidance and could most benefit from this policy. Teachers identified a number of obstacles to environmental education in CCA, including insufficient teacher training, scarce teaching resources, inadequate funding and lack of time. Based on the information we have gathered, we would like to put forth some recommendations for the improvement of environmental education in CCA schools. First of all, we would like to see environmental education included more consistently across subjects and grades. The frequent presentation of environmental education is important to ensure that ideas and opinions can be formed with the involvement of critical thinking. We would also like to see more Suggested Instructional Strategies that emphasize hands-on experiential learning and community-based experiences. Since a lack of quality resources appears to be a major obstacle towards incorporating environmental education in the classroom, we would recommend more environmental resources that can be easily obtained and directly applied to the NCTB. In order to ensure that informed and effective teaching methods are used, we would also recommend more training for teachers. The individual in this position could potentially fulfill some of the above recommenda-
tions. As well, the development of a more useful policy is recommended, since, although the present policy is a good start, it is almost useless if it is not implemented. According to Lieberman and Hoody (Lieberman & Hoody, 1998) that Environmental education has become a valuable tool in improving learner achievement which is forwarded to present and future generations to lead educational institutions.

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6. REFERENCES


