Understanding Environment: A Study of the Urban Poor Children

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Environmental Studies (EVS), an integrated approach to teach science and social studies, is designed to help children to appreciate the issues at the interface of science, technology and society. As socio-cultural contexts shape many ideas, developing meaningful understanding of environmental issues particularly among children of the poor urban settlement who carry experiences of diverse cultural elements because of 'rural-urban continuum' in living pattern and face striking mismatch between their social and classroom experiences, remains a critical issue. This paper based on a study of understanding of the urban poor children on various environmental issues, points that these children are able to assimilate a variety of social practices of both rural and urban societies, and their minute and often unusual observations of social phenomena will have larger implications for the teaching-learning of environmental issues in the classroom.

Keywords: Socio-cultural diversity, Understanding of environmental issues

Introduction

In recent years, the interface of science, technology and society (STS) has drawn attention towards a practical understanding of environmental and developmental issues. The National Curriculum Framework (2005) calls for strengthening the integrated approach to teach science and social science at the primary stage under the single subject of environmental studies (EVS) so that children are able to locate and comprehend relationships between the natural, social and cultural environment and appreciate the issues at the interface of science, technology and society. However, keeping in mind the striking mismatch between children's diverse social experiences and expected curricular knowledge, the implementation of EVS at the primary level asks for understanding the critical areas of concerns in teaching-learning of EVS. While a plethora of studies has focused on the learning needs of young children in the primary areas of school curriculum such as mathematics and language; there is a paucity of research on children's ideas about environmental issues especially in the context of increasing interface between science, technology and society.

Children bring with them to school different types of experience which orient them towards constructing different meanings from the classroom work. Several studies also confirm that one of the important factors that lead to poor understanding among children is the existence of preconceptions (i.e. ideas that children make about various phenomena they encounter prior to classroom teaching) and alternative frameworks (systematic understanding of information received based on her/his personal experiences). The NCF (2005) while emphasizing on the integrative character of education rightly acknowledges that "the local environment and the child's own experiences is the best 'entry point' into the study of disciplines of knowledge." According to Sjoberg and Imsen (1988), 'by taking some experiences for granted and as a starting point for teaching we may be unintentionally favouring some groups of children.' Chunawala and Ladage (1998) rightly suggest that wide range of activities which form basis of experiences of most children can serve as 'starting point' for teaching.

The perspective on the role of social context in learning, as a matter of fact, has greater implication for the teaching learning of EVS, as it is not a body of knowledge rather a part of children's life in society. It is important that the curricular knowledge and pedagogic practices in EVS classroom endorse children's outside school experiences and provide lenses for a critical understanding of the natural environment and local reality. To this end, the present study explores the ideas of children in a diverse social context about various environmental issues from a socially critical perspective to bring insight into conceptual understanding of social phenomena. More specifically, it aims at exploring children's ideas about various environmental issues; understanding 'naïve ideas'; and assessing basic mental abilities or 'process skills' that are important for developing understanding of environmental issues.

Methods

This study was conducted on Class V children in four government (MCD) schools catering to the need of children mainly of one poor urban settlement (*Kusumpur Pahari*) in

Delhi. A total of 160 children participated in the study. It may be noted that the primary school curriculum of municipality schools in Delhi while integrating some environmental issues in the subjects of language and mathematics in Class 1-II prescribes separate EVS syllabus in Classes III-V, dealing broadly with understanding of children's world i.e. self in the local and larger context. The textbooks include themes on animals, birds, plants, vegetables, fruits, materials, water, weather, food habits, health, cleanness, transport, social relationships etc. Hence, Class V children are at the stage when they have formally been informed about various aspects of environment.

Going away from the traditional approach to assessment of knowledge base, a measure of EVS was specifically designed to explore the understanding of the urban poor children about natural and social environment, knowledge of meaningful patterns and social relations. Although the items in the EVS measure linked to some of the themes prescribed in the textbook, an attempt was made to contextualize the items/ questions in children's real life situations. The criteria for assessment were thus based on a detailed study of content areas in the textbooks till Class IV hence, the measure to some extent was criterion based. The test was pre-tested on a small sample of class V children was finalized. The EVS measure included both close and open-ended items. Children's ideas were also extracted through drawings. However, a majority of the items were open-ended to encourage children to reflect on their ideas and thoughts. Some of the items are mentioned in the course of discussion of findings.

The test was administered in a group situation. Following the general instruction to the test, each question was read out and explained. Some questions were explained through examples and blackboard illustrations. Individual helps were also provided to children who sought clarifications later. In order to provide necessary opportunities to express their ideas, children were allowed to respond with a non-restrictive time frame. Children however took about one-half hour to all complete the items. Children's responses were analyzed in both quantitative and qualitative terms. Quantitative data analysis provided information about trends (e.g. percentage of students with different ideas). Analytical induction was used to analyze data collected in the forms of descriptions and drawings. Major findings are discussed in the following sections.

The Urban Poor Children and 'Rural-Urban Continuum'

The socio-cultural context of the sample children revealed that it exhibited rich diversity in terms of region, language and occupational patterns (Rao, 2006). Families were mostly from low-income social groups from villages of nearly fifteen states, majority of them were from four states. More than three-fourth of the families were from disadvantaged caste backgrounds. Nearly seventeen languages were spoken as mother tongues, although Hindi was the predominant home language of about 46 percent of families. Members of the household were engaged in a wide range of occupations. Educational background especially of main bread earners (mostly father) showed that about one-third had no education and among those who had education, more than one-half of them had primary level education. However, there was no relationship between the kind of occupation engaged in and the level of education of main bread earners. Lack of parental education coupled with general poor economic condition in the family and lack of parental involvement in children's study thus did not provide right environment or motivation for education. The social and economic contexts of the community thus in many ways were linked to the schooling of children.

On the other hand, as members of these families are spread in both the city and the native village, the link with the village was not cut off forever rather rural-urban migration worked as a continuum. Short term migration was part of their lives. Evidently, about 87 percent kept visiting their native villages (rural areas) on a regular basis for many reasons, such as, attending marriages and religious rituals/ ceremonies, meeting ailing family members at village, performing seasonal cultivation, taking school going children to villages during summer vacation etc. This kept the dynamics of the community with the larger network. Children also routinely migrate to villages with their parents, as they had a scope for getting re-enrolled as per admission policy within a specified time period. The pattern of irregular attendance, discontinuation, continued enrolment and re-enrolment were thus important features of educational context of the urban poor children.

It was found that because of the influence of the neighbourhood from different states and engagement in wide range of occupations and unique experiences of own native village; many children in the urban poor settlements were socialized in a multi-cultural context. They carried with them to school experiences of both the rural and urban societies. The classroom situations with such varied socio-cultural experiences of children likely to demand from teachers to maintain right balance to integrate a variety of experiences of children in the classroom discourse.

Larger Knowledge Base

The responses of the urban poor children on various environmental issues indicated that they had rich and larger knowledge base of environment. They were able to recall and express their day-to-day life experiences more precisely. As found, majority of children were able to name the vegetables that they took raw and cooked; and were able to represent (draw) vegetables they liked most near to the exact with minute

parts. As the community was close to airport, an analysis of children's drawings of aeroplane revealed their keen observations of an aeroplane. More than 90 percent children could draw an aeroplane and about one-half of them could show at least six prominent parts of an aeroplane and about one-fifth could show more than six parts. Majority of children were aware of food habits of different animals and even they could report changes in a variety of food habits of human being according to seasons. Children's idea about transport facilities included a wide range of facilities even those available in remote rural areas. It was also found that children while reporting on differences between bird and aeroplane, reported many structural and functional characteristics of aeroplane. Children were able to identify materials (wood, leather, plastic and iron) used in various things. Interestingly, they had an idea that although many things are made prominently of one material, for example, 'door is made of wood', still other materials are used such as 'iron handle and knob'. Similarly, shoes are made of leather, iron and wood; belt is made of leather and iron; and so on. These observations suggest that urban poor children have a keen sense of observation and holistic perception of things.

Role Models

Role models happen to be a powerful force for providing direction in achieving goals. Perception of role model reflects one's thinking about qualities that are considered important for development of his/her 'self'. Having a role model is healthy as it increases a self-esteem, help to build morals and positive values and to set attainable goals. But a role model does not have to be someone eminent. It could be a family member or neighbour or social celebrity or professional. Often a person who actually interacts makes a better role model. From this interactionism framework, do the children from disadvantaged sections find a role model in their immediate environment? From socio-psychological perspective, does the social environment influence the thought feelings, and behaviours of these children? In other words, how children's thoughts are influenced by the actual, imagined or implied presence of others?

Results revealed that children perceived members in family, neighbourhood and community as significant role models. Relatively higher percentage of children perceived family members (father or uncle, brother or sister) and community (especially persons respected by others or/and with special qualities like community leader, players, artists etc.) as their role models. Substantial proportion also identified with professionals/ officials working in/around community like doctor, policeman, teacher etc. However, there were remarkable gender differences on the perceptions of role models. Family and community members were 'significant others' for girls whereas professionals and peers for boys. As revealed, 42 percent girls against 23 percent boys wanted to be like family members. Considerably higher percentage of girls (19 percent) than boys (11 percent) also perceived some community members as their role models. Interactions with children revealed that girls liked other adolescent girls in the community who had higher education or any job for the reason that they carried a different social identity in the community. On the other hand, significantly higher percentage of boys (31 percent) than girls (5 percent) identified with peers. Higher percentage boys (35 percent) than girls (29 percent) also wanted to be like any other professionals in the community. Children's ideas about role models thus indicated that children had their own preferences and goals.

Sensitivity towards Life Problems

In view of the unique problems that the people in the urban settlements face, an attempt was made to understand the sensitiveness and concerns of children with regard to water and health related problems. It was found that children understood the inevitability of water in their life and were aware of various sources of water. They could describe the problems that community people usually face during collection of water from a common source in a lively manner. Children's ideas about 'usefulness' of water was examined using the question 'if there were no water in your house in a day, what would happen?' The responses of children varied from generalized statements to specific observations. More than one-third of children linked non-availability water to survival (e.g. cannot live without water, will die in thirst) whereas little more than one-half expressed their concern over non-performing day-to-day basic activities such as cooking food, washing utensils and clothes, taking bath etc. Children's responses indicated that they were not only sensitive to the day-to-day problems but also aware of possible solutions to such problems.

While recognizing the usefulness of water in daily life, children were also aware of problems they would face with excess water caused by heavy rain. More than one-half of children reported about household problems (e.g. leakage of water from roof, dirtiness inside house due to water leakage, cannot cook food etc.) whereas 28 percent children reported about problems in the community life (e.g. road blockage, water logging, unhygienic conditions, infectious diseases, electricity failure etc.) and another 21 percent showed concern over both household and community problems. It should be noted that such experiences of children in daily lives are not well integrated with textual materials rather it is portrayed that people eagerly wait for rain and enjoy rainfalls.

Children's awareness about health problems was gauged through their recall of illness / health problem that any family members had during last one year and their ideas on reasons for such illness. From the responses, it was found that more than one half of children reported about illness of parents, and

a majority of them were able to recall the name of such illness. But, many of them had little knowledge about reasons for such illness. Some of the responses even appeared naïve ideas.

Naïve Ideas

Notwithstanding the rich knowledge base of children in the urban poor settlement, there were many 'naïve ideas' rooted primarily in their personal experiences. For example, although many students were able to provide reasons for illness of their family members, some reasons were simplistic ideas, for example, 'one suffered from malaria due to hard work, heat stroke, no rest, bath in evening etc. As the concepts of 'fast' and 'slow' are relative (especially on traffic roads), some naïve ideas were found based on personal experiences while responding to the question- 'among the vehicles which one runs faster. For example, some children reported that 'auto in which they were travelling overtook buses, hence auto run faster'. Similarly, few others cited incidence of how scooter overtook other vehicles like auto, bus, taxi etc. Of the total children about one-half reported that bus runs faster than scooter and auto rickshaw whereas about 30 percent reported scooter and 11 percent reported auto rickshaw.

Knowledge of Environment and Basic Mental Abilities

One of the important aspects of cognitive approach to education is the concern for development of basic mental abilities in the process of learning and improving retention of knowledge. Bruner (1966) emphasizes that instruction should take into account not only the nature of knowledge but also the nature of the knowledge getting process. The NCF (2005) while emphasizing on the incorporation of experiences of the socio-cultural world in the curriculum also points that the approach to draw one's learning should use methods of like observing, comparing, classifying, categorizing, seeing relationships, establishing meaningful connections, reasoning etc in relation to the experiences. As mentioned earlier, in this study, while assessing the children's understanding of various environmental phenomena, an attempt was also made assess some of these basic 'process skills' that are important for acquisition of knowledge. These are discussed, as follows.

Comparison

Most formal school knowledge demands that children need to compare in order to conceptualize. Children's ability to compare was assessed through tasks in which given the pictures of two animals (i.e., cow and a horse) they were asked to find out similarities and differences between the two animals. In another task they were asked to report on differences between bird and aeroplane having analogical relations. A majority of children (about 90 percent) could report some similarities and differences between cow and horse. Responses however revealed that children focused primarily on physical features of the animals. Their ideas perhaps was dominated by the visual clues (available in the pictures of animals), hence, they overlooked the functional aspects. It may be noted that pictorial representations depicting a contrived reality although provide some tip-off to think; at times, it limits lateral thinking. As found, children while reporting on differences between bird and aeroplane, their ideas encompassed both structural and functional features. Some of the frequent responses were- 'bird moves slower than aeroplane', 'bird uses feather to fly', 'bird is smaller than aeroplane' 'bird is natural and aeroplane is manmade', 'aeroplane takes people and flies', 'bird flies in less height', 'bird flies herself and aeroplane by pilot' 'bird flies zig-zag and aeroplane straight' and so on.

Classification

Like comparison, ability to classify or categorize also helps children to form concepts. However, often difficulty arises when some of the attributes are found common to many concepts. Children tend to focus on one attribute than others and fail to classify objects. For younger children, unless the attributes are made explicit, they find it difficult to believe. Children's understanding of concept of *herbivorous* and *carnivorous* animals were assessed using a task where an example was given under each category and children were asked to name more animals those come under each category. As found, most frequent names under each category were from immediate environment such as goats, cows, buffalos, donkeys, elephant etc. under herbivorous whereas dog under carnivorous category.

The ideas of children about 'living' and 'non-living' things were assessed using the question- 'which of the given things (e.g. T.V, cycle, tree, sun, hair, toy, crow and fish) breathe and grow?' instead of asking which one is a 'living' and 'non-living' thing. It was found that the attribute 'action' primarily governed the process of classification. About 22 percent of children believed that trees breathe, whereas 49 percent believed trees grow. The critical issue is that many living things such as plants are not obviously in action as one looks at them. As Wenhman (2005), reports many children do not regard plants as being alive or think that they are some how less alive than animals. About two-third of children believed that crow and fish breathe, but only about 20 percent believed that they grow. From 6 to 10 percent of children reported that T.V., cycle, toy and sun also grow. Such observations suggest that children's ideas are perceptually dominated. Similar observation was made by Chunawala, Natarajan, Apte, and Ramadas (1996) who found primary school children think many of the 'non-living' things such as sun and toys as 'living' mainly because of the observation of their movement.

Meaningful connections

Children's ability to find association between things was assessed through the question- 'what differences do you find

during the May-June and December-January with regard to weather, cloth patterns and food habits?' More than two-third of children could find an association between time period and seasonal features. Although children's descriptions about cloth pattern varied (e.g. responses such as 'cotton and woollen / warm' 'thin and thick cloth', 'T-shirt and full-shirt' etc.), it clearly reflected their knowledge of association between seasons and cloth pattern. Children' responses on food habits also indicated a wide range of ideas on season-specific vegetables, fruits and other food materials.

Logical ability

In order to assess the logical ability children were required to 'identify one from a set of things that they think is different from others and also to provide reasons for the same. The tasks revolved around specific concepts such as body parts (internal and external), properties of materials (solid and liquid) and transport system (road and air). Majority of children were able to identify one from a set of things and provided logic for the same. But while many responses deviated from expected (standard) one as per text materials, in many cases reasons provided by children appeared very much simplistic. For example, the response such as 'ear is different from other parts of body like eye, nose and heart because it helps in hearing'. Similarly, 'eyes for seeing', 'nose for smelling or breathing'; hence are different from others. Although about 60 percent of children could differentiate heart from other parts of body (eye, nose and ear), only 32 percent children provided the expected (informed) logic i.e. 'internal part of body'. Some other reasons though were found meaningful, deviated from 'textbook logic' such as 'heart beats' (30 percent), 'used for breathing' (7 percent) and 'heart loves / *dil hai / dil baheta hai / dil mein hota hai etc'* (6 percent). On the task based on properties of materials, 38 percent children could differentiate salt from water, milk and honey. Of these children, only 22 percent provided the logic of solid/ hard. Other reasons were 'used with other food materials' (30 percent), 'salty' (20 percent), and 'look white' (3 percent). Children those who differentiated water or honey from others, the reasons were based on 'usefulness' and other specific features. Majority of children differentiated aeroplane from other vehicles and logic provided for the same gave an idea about children's understanding of transport system, still few children provided simplistic explanations. Results suggest that often logic provided by children is a mere expression of the descriptions.

Conclusions

This study attempted to explore the ideas of children about a range of environmental issues and also assess basic mental abilities of children that are important for understanding relationships between the natural, social and cultural environment and developing clear understanding of environmental issues. Results revealed that with the natural capacities to make sense of things around, children of the poor urban settlement were able to assimilate a variety of social practices of the rural and urban societies, thus, indicating a rich pool of knowledge on environmental issues. However, many children had simplistic ideas and tended to uncritically generalize from personal experiences. The critical issue is that if knowledge of environment is to be transmitted within cognitive understanding of the urban poor children, their minute and often unusual observations of social phenomena cannot be overlooked rather should be used as strong anchorage for learning. If the formal schooling has to play an important role in helping these children to understand the environmental issues in realistic manner, then it is imperative to understand their pre-existing ideas about various social phenomena as most of the children's thinking and models of the natural world seemed to be determined by a wide range of experiences in diverse socio-cultural contexts. Although EVS textbooks represent relevant ideas commensurate to developmental level of children so as to provide them necessary understanding about their immediate environment, their understanding of immediate environment needs to be translated into formal concepts of environment.

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