

Stepping Outside the Classroom: An Opportunity for Rich Learning

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The real world exists outside the four walls of the classrooms. Despite knowing this fact, both schools as well as larger education system seem to constrain themselves by imprisoning the enterprise of educating children within the boundary of four walls. If the purpose of education is to prepare students for their future, then how can education remain captured within the four walls of the classroom (*Dewey, 1916*)? A liberating education must be authentic and relevant to the students' lives. It should value students' knowledge, place both teachers and students as co-learners in a context of problem posing pedagogy (*Freire, 1968*).

Taking students outside the classroom is often considered to be an additional activity or an extravagance for teachers or students or both. Additionally, instead of taking the centre stage in knowledge construction, these are treated as inert extensions of content taught in the classroom. The lacunae created by such an approach is evident in the teaching of many subjects. Learning Without Burden (*Gol, 1992*) categorically mentioned the alienating nature of India's classroom culture. The most recent Curriculum Framework 2005 (*NCF 2005*) recommends connecting the classroom to the outside world. It has suggested the inclusion of project work, survey, observation, data collection, thematic teaching, group work, different forms of assessment including self- and peer assessment as a part of regular pedagogy.

Although in the post-NCF 2005 scenario there has been an increase in the frequency of assigning projects in the school curriculum (*Shome & Natarajan, 2013*), there is a need to develop projects as meaningful learning experience for students (*Shome, 2013*) and intersperse this with other proposals in the project work (*Shome & Natarajan, 2013*). Taking students outside the classroom and integrating thematic teaching provides a rich context for learning.

In this article, we will present a narrative of some of the select teaching episodes of some topics in the subjects of Science and environmental studies carried out with the students of grade 3 to 7. We

will present the topics as a unit of narration. Under each unit, we will provide a brief outline of the motivation, the grade and the number of students, the way the topic is introduced, the teaching sequence, the nature of students' engagement in the work and learning from this exercise and the insights we gained for the future.

Waste collection and segregation

The core of waste management is collecting and segregating waste, which can be done in multiple ways: based on its use, source or origin, nature of degradation, materials, specific objects etc. The activity of waste collection and segregation at school level can be a true learning experience for students in several ways.

Through waste collection, students come into direct contact with waste, witness the severity of waste (e.g. plastic packets mixed with degraded vegetables), acknowledge the amount of waste produced by own actions, etc. These experiences can be triggers for students to take environmentally responsible decisions as they find themselves directly responsible for waste production. Similarly, segregation of waste leads to several learning opportunities such as the ability to classify a given mixture of materials based on their properties and future use.

In this activity, we had asked the students of grades 3 and 4 to clean the school playground by picking up waste and piling it up in one place. After a group discussion, students proposed segregation of material categorised as parts of plants, stone and soil, plastic-polythene, and metallic substances. The students then found ways of recycling all waste except plastic and polythene.

Teaching about plants and surroundings

A lesson on Trees in the grade 1 English textbook created an opportunity of integrating knowledge from students' environment. Students were familiar with trees as a part of their surroundings. When the lesson was taught and discussed in the classroom, it was realised that learning would be better if the students are taken from the classroom

and provided first-hand experience.

One way of introducing the parts of plants would be to draw and label them as given in the textbook. However, this is not a true representation of a tree. We gave authentic experiences to the students by taking them out and giving them the opportunity to understand, observe, and explore trees, noting the green leaves and branches. This led to personal observations on the differences between the textbook presentation and the actual experience. They further discovered that a tree had a hollow on the trunk and guessed that some animals would live inside it. One of the students exclaimed that an ant was climbing on the tree, while another student pointed out that it was not *climbing* but *crawling*, words which had been taught just then. They observed flowers at the bottom of the tree and that the roots were visible from the topsoil. It is not necessary that root will always be inside soil and out of our sight! Similarly, they noted a bird's nest in the tree. They were excited to find the similarities between class discussions and reality.

The responses from the students indicate that taking them out helped nurture their sense of appreciation towards nature and its diversity, especially the structure and essence of trees. The children were asked questions on their observations and they enthusiastically replied to the questions including those who were quiet in the class before going on the trip.

Study of vermicomposting

The study of vermicomposting is a part of understanding recycling. It is also included in the NCERT textbooks of grades 3 and 4. Students knew that the school maintains a vermicomposting pit, but they were unaware of the mechanism and the role of the earthworm in this process. Once the Hindi term *kechua khad* was introduced, the students replied that earthworms create compost. In the beginning, students knew very little about the earthworm, either its appearance, its use or its habitat. To provide better clarity about the role of the earthworm in vermicomposting we carried out an activity outside the classroom. First, students were given a one-page article on vermicomposting in Hindi and in English. When asked 'where will we find the earthworm?' all of them replied 'in the soil'. They were asked to form groups of four or five. Then each group was given a transparent plastic box and asked to collect soil from the field

removing big stones and pebbles. Interestingly, we did not find earthworms in the soil and therefore had to collect them from the vermicompost heap. Students observed the earthworms placed on the sack, first with the naked eye and later with a hand lens. Students reported that earthworms do not have eyes, ears, hands, and feet. They noted how an earthworm stretches its body while in locomotion. They concluded that the earthworm's body dried up when kept in a dry place or under the sun.

After the observation, the earthworms were weighed and kept in the boxes given to them at the start. The boxes were filled with grass and weeds and the students were asked to add more grass and banana peels regularly.

The activity continued for two months. Once the material from the boxes was removed, there were multiple earthworms and decayed material in the box. This observation gave us an opportunity to talk about how earthworms help reduce the material and play an environment-friendly role.

Water project

Two chapters of the EVS textbook of grades 3 and 4 were integrated as they had the common theme of water. We had prepared a worksheet based on the survey questions given in the chapters on water audit, use of water, estimation of volume of water, proposals to reduce water use and wastage, suggesting measures to preserve water and how we can reduce water wastage in school and at home.

Students filled the worksheets given to them on conducting audit, survey (eg number of taps, leaking taps) and carried out measurements (eg number of spoonfuls of water required to fill a mug). They questioned relevant people for instance those who looked after the toilets. We found that students who were disinterested and reluctant in classroom activities participated actively in this task and completed the worksheet.

Learning about biodiversity

Teaching and learning about biodiversity, most importantly, the sensitivity and appreciation of biodiversity can be generated only by contact with nature. Keeping this in mind, we have integrated stepping outside the classroom as an integral part of consolidating learning in the classroom. Here we will present how we have introduced following topics to our students.

Bird watching

As this is part of the NCERT textbooks of grades 3 and 4, students were provided bird cards and asked to spot the birds in the school. Students were also asked to observe nests of different birds and their eggs found in the surroundings and make reports based on observation. Later, students made birds' nests and eggs based on their observations.

Surveying plants

While teaching about different kinds of plants and parts of plants, we carried out a project-based learning pedagogy with the students of grade 6. Students surveyed the school compound and carried out a species count as well as population count for different species of plants, measured their length, estimated strength, noted structure of plants and parts of plants, presence of flower, fruits, seeds, classified different plants (e.g. herbs, shrubs, tree, monocot, dicot etc.) as well as different parts of plants (e.g. based on leaf venation and margin). We also collected a large number of plant samples, discovered the relationship between leaf venation, root pattern, and type of cotyledon etc. With a similar intention, a short activity was conducted with students of grade 5 on exploring different parts of the plants and classifying them.

Observing fungi

While introducing different organism in the science class of grade 7, students were taken out to the grounds to spot different types of fungi. Five kinds were discovered. They were guided to observe the visible structure of the fungi.

Surveying Insects

Knowing about insects is crucial in developing environmental awareness as insects occupy a crucial role in the food chain and maintain balance in the eco-system in multiple ways, such as pollination. Students identified different types of insects found in the school campus and the number of insects of each type observed in the different locations of the

school.

Identifying and removing invasive species

Uncontrolled growth of invasive species is a major environmental problem for human beings. It is important to gain knowledge about identifying invasive species and develop awareness about their actions to mitigate their spread. Students of grades 5 to 8 were taken to the ground and asked to uproot three invasive kinds of plants in the school ground and asked to segregate the plants. Students pointed out the dominant species existing in abundance. We also discussed that these plants are not eaten by cattle and talked about features of the plants which allow them to dominate other plants.

Learning and the way forward

We have observed that taking students out of the classroom provides a rich context for learning. Students take interest in the process and learn in the process. The NCERT textbooks as well as NCF 2005 asks for such methods to be adopted in the classroom. The textbook representation of the content about the world does not directly correspond to the real world. Taking students outside the classroom gives them a real sense, situates them in a real context and helps to facilitate their learning. Students could relate their observation with textbook content and get more detailed knowledge.

We realise that to carry out such work it is important to prepare well-thought-out teaching plans, integrating different content and skills with either printed worksheets or written data collection formats. Flexible school timetables and long duration class periods of one hour or more, with elements of writing and data collection, tabulation, and analysis are important. We have also found that it is important to bridge the connection between processes inside and outside the classroom as supporting each other rather than as isolated experiences.

Acknowledgements

We thank our colleagues Kharul Nisha and Dinesh Bartwal for their inputs on the unit *Waste Collection and Segregation* and our students who took part in the process.

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