

Education for sustainability: curriculum provisions and teaching–learning in India

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The issues related to sustainability are emphasized in policy documents and included in textbooks in India. However, the dismal teaching–learning conditions raise concerns about the quality of delivery to students. Amidst these inconsistencies regarding education for sustainability, the present study sought to examine its existing status in two schools in Bengaluru, Karnataka, India. An interview was conducted and classroom observations made involving 35 teachers in total. The study showed that teachers’ knowledge and attitude about sustainability were limited and non-scientific at times. Knowledge about climate and sustainability was transferred in an exam-centred manner without any focus on developing attitudes amongst the students. Highlighting the role of social experiences and cultural capital of teachers, this study suggests a need for concerted efforts to address their deep-rooted understanding and attitudes regarding sustainability.

Keywords: Climate change, classroom observations, education for sustainability, sustainable development, teachers’ understanding.

SCIENTIFIC knowledge has provided ample evidence of deteriorating ecosystems which are having an impact on the living conditions and livelihoods of humans. The search for better living conditions has also led to displacement and migration. The industrial and economical activities derive profit from human and natural ecological resources which are largely governed by social and industrial policies. Consequently, the mitigation and adaptation efforts have also been governed by different philosophical positions about the economic and political decisions. Some researchers believe that technological advancements can replace the damages done and exchange them for better goods and services. On the other hand, there are individuals and groups who argue that natural resources are completely irreplaceable¹. However, the role of human actions in preserving natural resources and reducing the after effects of their excessive exploitation is unanimously agreed upon. By focusing on the three ‘Es’ – economy, equity and ecology – the Brundtland Report (1987) postulated that meeting ‘the needs of the present without compromising the ability of future generations to meet

their own needs’ should be the paradigm for the industrial and economic growth². This report was institutionalized amidst a growing understanding that by protecting and enhancing the natural resources we can achieve a sustainable economy, social and economic stability, and harmony among citizens³. Government and non-Government bodies across the globe are in consensus with the urgent need to control climate change and regulate its development to make it more sustainable. At the same time there is growing realization that climate change adaptation and mitigation strategies require considerable shift in human behaviour and choices. Although various natural, personal, social, organizational, community and global factors collectively contribute to sustainability⁴, at the core of all the above efforts are the individual attitude and behaviour governing our choices, collective actions and policy decisions⁵. With multiple such realizations, the recent understanding of sustainability goes beyond the framework proposed by the Brundtland Report.

It becomes imperative that the younger generations be equipped with knowledge and attitude to work towards sustainability. Making the right choices and cultivating the correct values start with education. Therefore, education for sustainability (EFS) is critical for climate change mitigation and adaptation, laying the foundation of environmental ethics as habits, values and attitudes⁶. Sustainable patterns of living can be inculcated amongst students through the subjects that are a part of their formal curriculum and by demonstrating a sustainable ecosystem. Each subject provides an opportunity to understand and practice different aspects of sustainability, along with helping the students gain the required skills. For example, in science, students learn about the interconnectedness of various systems of the world, thereby understanding how one affects the other. In social science, students learn about the aspects of social inequality and social lives of people. Languages can teach about empathy and connect students with nature. Students can learn about the interconnectedness of various systems of the world, thereby understanding how one affects the other⁷. By understanding the cause and effect relationship between external phenomena and individual actions, they become responsible for their choices towards the environment⁸. In this way EFS cultivates critical and holistic thinking, communication skills, scientific temperament, informed decision-making and problem-solving to overcome the challenges

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posed by the climate change⁹. By developing sensitivity towards the environment and society, EfS can contribute in two ways. First, it can make students respect, conserve and share resources equitably. Second, it can orient students towards the need for right policies and innovations leading to sustainable outcomes. Realizing the foundational role of EfS, Governments across the world have been keen to impart the same to their children and youth.

Education for sustainability: policies and practices in India

As a definite response by the Government post-independence, the environmental concerns have been incorporated in the Constitution of India right from 1976. Various policies and documents have periodically indicated the commitment of the Government in this direction. At present two ministries, i.e. the Ministry of Human Resource Development (MHRD) and the Ministry of Environment and Forests (MoEF), Government of India (GoI) work for education on climate change. MHRD (recently renamed as the Ministry of Education) functions through the National Council of Educational Research and Training (NCERT) for education on climate change. MoEF provides active funding for climate education. A Supreme Court ruling in 2003 made environmental education compulsory at all levels of study. The Government mandate had been translated into actual efforts in textbooks and teacher's curriculum. At present the document which guides the aims of the curriculum is the National Curriculum Framework (NCF)¹⁰. It emphasizes that the curriculum should sensitize students towards the environment and promote education for equality. It underscores a holistic understanding of sustainability rather than endorsing information-sharing about climate change. It also suggests several constructive ways of achieving this goal, such as bringing local resources and examples in the classroom, sensitizing students about their surroundings and familiarizing them about the interconnects of consumption and production in personal and social life¹⁰. The National Education Policy (2020) of GoI also places great emphasis on the incorporation of the Sustainable Development Goals in the curriculum¹¹. It states that not just the curriculum, but the school culture should be improvised to sensitize students towards the needs of sustainable development¹¹.

Further, policies have also been sensitive to the fact that the teacher is the most critical classroom resource who decides the outcome of learning. Therefore, a National Curriculum Framework for Teacher Education was drafted to establish key curricular areas of teacher education¹². It reiterated that teachers are responsible to promote the idea of sustainable development, equity, harmony and mutual respect. Both teachers and students need to be educated to change their consumption patterns and pre-

serve natural resources¹². In this way, different policy documents focus on EfS in coordinated ways.

Themes of sustainability in textbooks

The books published by NCERT are the model textbooks for all state-run schools. Though the states are free to publish their own textbooks, the NCERT books serve as a model for state-published textbooks. Written using the guidelines from NCF (2005), the current NCERT textbooks have much focus on sensitizing students to their surrounding and humanitarian values. Right from the primary to higher secondary classes, there are several themes weaved into the curriculum which address the values of a sustainable society and development. The textbooks also urge teachers to increase their engagement in transacting the knowledge with a commitment to the environment and minority communities. Most of the subjects in different grades provide not just information, but attempts to build an attitude towards sustainability. For example, the books on environmental studies (for classes 3–5) advise teachers to encourage observation and sensitivity among students towards their surroundings. The themes covered in the books include everyday real-life incidents, challenges related to natural resources like fuel, water, forests, protection of animals and pollution, etc.^{13–15}. The social science books for classes 6–8 highlight several social aspects of sustainable development. The books discuss themes such as justice, liberty, fraternity and equality using different anecdotes and case studies^{16–18}. The class-9 textbook for economics is all about the sustainability of resources, poverty as a challenge and food security in India. Through the different chapters, the book explains the factors of production of goods and services, including land, labour, human capital and physical capital through stories and case studies¹⁹. The geography textbook for class 9 contains themes about current location, demographic details, climate and population of India. It provides details on the physical features of India, developing a sense of awareness about these features and the importance of each feature²⁰. It also highlights the significance of these features for humans. Similarly the science textbook for class 9 focuses on weather, climate and adaptation, winds, soil and water²¹. Most of the topics covered in these textbooks provide scope for further discussion, and establishing connections between students, surroundings and environmental degradation. Needless to say that such awareness should be successful in increasing sensibility towards the natural resources in our surroundings and issues of equality and justice.

Teachers' readiness for teaching sustainability

Experts agree that topics such as sustainability should be percolated into value systems rather than gaining information

about them and reproducing in the examinations⁸. The curricula are to be transmitted to students by the teachers. Policies and textbooks dealing with sustainability will not have any impact, unless the teachers build upon the existing knowledge through the lived experiences of students²². It is important that teachers establish connections of the textbook knowledge about climate and society with the immediate surroundings of the students. Apart from sharing knowledge, teachers and schools should be able to demonstrate sustainable lifestyle choices. For example, teachers should be conscious of using material resources and environment-friendly sources in the classroom⁹. Thus, for a meaningful EfS, teachers must have knowledge about environmental degradation and social inequality caused by human actions. They must be able to transmit this knowledge and understanding in their teaching and other interactions with students. Thus, for EfS to be effective a teacher must have adequate knowledge, right perspectives and transactional skills, to build corresponding perspectives amongst the students. However, the system remains examination-driven and performance-based, rather than encouraging pro-climate attitude and behaviour among students²³. Moreover, several studies and reports from India have remarked that the training of teachers does not get much attention and resources²⁴. In effect, even if there are policies and textbooks in place, the status of EfS remains ambiguous.

Present study

Though the national policies and textbooks incorporate mechanisms for learning for sustainable living, there are reports about the poor teaching-learning conditions and lack of teachers training programmes^{23,24}. There is no specific report on the actual outcome of EfS. Nor is there any estimate or understanding about how teachers transmit knowledge about issues related to sustainability to the students. With this background, the present study was planned to explore EfS in schools. Since teachers have the onus of transmitting the knowledge to students, the present study planned to survey their understanding about sustainability and classroom teaching of related themes.

Method

Sample

Thirty-five teachers from two schools – one Government school affiliated to CBSE and another private school affiliated to ICSE, both located in Bengaluru, Karnataka, India, were selected. Since sustainability is concerned with all the subjects, a total of 35 teachers teaching english, hindi, kannada, mathematics, environmental science, science and social science in classes 5–9 were interviewed. All the interviewed teachers were observed in their respective

classes. Total time of observation was 38 hours constituting 18 days in each school.

Tools and data collection

Survey: Using a questionnaire, teachers were asked the following questions: (i) What is your understanding of the term ‘sustainable development’? (Teachers were expected to mention different aspects of sustainability in their response). (ii) Do you think the issues related to climate change and sustainable development are incorporated in the school curriculum?

Observation: A formal non-participant observation was made. Prior consent of the school principals and teachers was taken for the same. The teachers were informed about the purpose of the study, after which they suggested the classes for observation based on the topics covered therein. This could mean that teachers demonstrated their best practices. To counter the influence of the observers and for a relaxed setting the researchers established a rapport with the teachers and students. The observations and interactions were noted for analysis.

Analysis

The interviews were transcribed for further analysis. The answers given by the teachers were analysed for the factors they had mentioned and the explanations provided. The frequencies of the key responses were counted and their percentages calculated. The sections of classroom observations which were concerned with sustainability were transcribed and described.

Results

In the survey the teachers were asked, ‘what is your understanding of the term ‘sustainable development’? Following were the key findings:

Out of the 35 interviews conducted, 31(88.5%) teachers mentioned only one or two aspects of sustainability, e.g. industry or economy.

Remaining four teachers (12%) mentioned more than two aspects of sustainability, i.e. development, conservation, regeneration of resources, needs of future generations, etc. The responses that included phrases and terms like ‘overall development’ (economic, environmental, social), ‘preserving for the future generation’, ‘saving resources’, ‘adopting environmental-friendly practices’, ‘Sustainable Development Goals’ (SDG), were considered to be partially or fully correct depending on number of the terms or how close the definition was to that given in the Brundtland report. Only one teacher mentioned SDG given by the United Nations (UN).

Eight teachers were uncomfortable with the question and were recorded saying:

- ‘I am not comfortable, please ask someone else’.
- ‘I can’t understand the term’.
- ‘Actually i am a Maths teacher. I don’t know what this is’.
- ‘Sustainable development, what to say, i don’t know’.
- ‘Very difficult terms you are asking!’.

Four out of the total respondents admitted not knowing anything about sustainability or SDG.

For the teachers to be able to transmit knowledge about sustainability to the students, they should first be aware of the various aspects of sustainability in the curriculum. Therefore, to examine teachers’ awareness about the curriculum, they were asked whether the themes related to sustainability were included in the syllabus. In their responses, only 9 out of 35 teachers said ‘yes’. Rest of the 26 teachers were not aware if the curriculum included themes related to sustainability. Further, those who said ‘yes’ also felt that it was covered only in environmental studies and science textbooks. Apparently, they see sustainability only as related to the environment and climate change, ignoring the social and economic aspects of the same. The answer to the two questions revealed that most of the teachers were neither fully aware of sustainability as a concept nor did they know about its inclusion in the curriculum.

Classroom observations

A gap in knowledge and practice: The curriculum and pedagogy should be linked to the real life of a child and she/he should be able to apply the learning acquired through formal education at school in his life. While they taught about conservation of resources, teachers were not seen practising it. It was a common sight to observe teachers and students moving out of the room without switching off the lights and fans. There was an episode where a student informed her teacher about a leaking water tap. In response the teacher merely smiled at the student and said ‘ok’, without addressing the issue. This apathy highlights the gap between formal education and actual practice. It was observed that the school is merely treated as an

institution to help students to memorize information through a formal curriculum and reproduce the same during examinations.

Tokenism and exam-centred teaching: The classrooms had posters all over the notice-boards and walls with pro-environment messages such as ‘save water’, ‘save electricity’, ‘plant trees’, etc. Despite being exposed to such topics through the syllabus, neither the teachers nor the students demonstrated sustainable behaviour in these areas. Whenever an issue emerged or a student questioned about real-life instances of sustainability, teachers were frequently observed saying ‘focus on what is being taught.’ For example, one of the geography teachers (name undisclosed) was observed teaching about canal systems and waterways. Following is the exchange between her and a student:

- Student – How canal is made ma’am?
- Teacher – Land is cut open
- Student – What about the people living there ma’am? If anyone is living there.
- Teacher – What do you mean? The land is cut open, the people are replaced and the canal is made. It’s simple.

The student had a valid doubt regarding the human and social side of various infrastructural and development projects. This opportunity could have been used by the teacher to discuss the issue of displacement that affects thousands of people when development projects are initiated by the Government and private agencies. Such opportunities could be used to sensitize the students to consider livelihood and displacement issues involved in development projects. Students could have been encouraged to think of ways to handle this problem faced by marginalized people and the need for growing an economy. The teacher did not do any of these, but asked the student to ‘focus on studies’.

On other occasions, teachers’ own values and beliefs were blinding students’ queries and thinking. In one of the classes, the teacher was asked about global warming while teaching about travel and the world landscape:

- Student: Why don’t they simply use land ma’am?
- Teacher – Because it is easier to travel through waterways; no service charge.
- Student – I read on Wikipedia that India and Africa were joined. Does global warming cause this land separation?
- Teacher – Yes they were, it’s true. Have you heard of forms of Vishnu? There happens complete destruction and then new beginnings. So, we need not worry about global warming, nature has its own way of restarting. Natural disasters are normal; nature is okay. It is the man-made disasters we need to worry about. We need to think about what we are doing on earth. But destruction and rebirth have been happening since the beginning.

Table 1. Factors mentioned by teachers as sustainable development

Terms used to define/describe sustainable development	Number/percentage
Development in children or individuals	9 (23.1)
Sustainable development goals	1 (2.6)
Saving natural resources	7 (17.9)
Environment-friendly practices – recycling, not using plastic	7 (17.9)
Taking care of the planet for future generations	7 (17.9)
Development of the country – infrastructure and market	8 (20.5)

Visibly a teacher of class 9 was attributing climate change and natural disaster to forms of Vishnu and providing unscientific explanations. Rather than showing the connection between human activities and disasters, she was guiding students towards an oblivion of global warming which requires our immediate attention. It was observed on several occasions that instead of addressing the belief system and deep-rooted habits of students, the teachers were focused only on getting the syllabus and class notes completed. Apparently, teachers have to complete a vast syllabus in limited time. This forces them to focus on sharing information given in a chapter and then quickly move to the 'question and answer' session. Such a monotonous teaching without any discussion and perspective building will not be able to achieve the goals of EfS. It only forces the teachers to stick to the textbook and let the students pass examinations.

Discussion

The present survey was done to assess teachers' understanding of sustainability. In their answer to the first question about sustainability, most of the teachers gave broad answers like environment-friendly practices (17%), taking care of the planet (17%) and reducing the use of plastics (17%). The fact that 31 teachers (88.5%) could not mention more than two aspects of sustainability implies that none of them had a holistic idea about it. Interestingly, 23% of respondents mentioned 'personality development of a child' as sustainable development. Clearly, the teachers guessed the meaning from the word development. Only one teacher mentioned the UN SDGs.

The response of teachers to the second question showed that only 26% (9 out of 35) were aware that the curriculum they teach addresses the issues of sustainability. As mentioned earlier, all the NCERT textbooks across different subjects address social and environmental issues which are linked with sustainability. However, 74% of the teachers were unaware of this. The teachers who were aware of this only mentioned that at environmental studies and science subjects had topics related to sustainability. The answers to the two questions about sustainability lead to the following conclusions: the teachers are ill-informed and unaware of the concepts and issues around sustainability, though it is present in the textbooks that they teach. Their responses reflect disconnect from the knowledge and debates around sustainability. Further, the classroom observations substantiate what was found in the survey. On several occasions, it was observed that the teachers brought in their religious and cultural beliefs while discussing issues around sustainability with the students. They would often provide non-scientific information while discussing about the issues related to climate change and ecology. It is also worth mentioning that the observed teachers were from two schools from a developed city like

Bengaluru. The condition of teachers from rural and semi-urban areas can only be conjectured.

The content in the textbooks is supposed to be carried forward and related to the student's lived experiences, in order to inculcate sustainable values. In the present study, the teachers were not doing this. The misinformation on the part of teachers barred them from capitalizing on the textbook content in their teaching. This situation indeed confirms earlier reports and findings of poor training and motivation amongst teachers in India²⁴. The present study also supports earlier reports that teachers are only delivering agents of prescribed textbooks, who struggle to make students cram and perform well in the examinations²³.

Teachers' inability to connect with the scientific knowledge and ignoring the larger consequences of human action can be attributed to the socialization, long-term beliefs and their experiences²⁵. According to Bourdieu²⁶, it is the limitation imposed by the habitus of the teachers. Habitus can be explained as deeply engrained habits, skills and dispositions, which are a result of past experiences and are historically designed. It is built by accumulated symbols, meanings and schemata²⁶. Thus, a teachers' inability to address the issues of sustainability and lack of necessary knowledge, predispositions and choices towards a sustainable lifestyle indicate a lack of habitus for the same. When a teacher ignores a leaking tap, or explains global warming with mythological anecdotes, she is manifesting her habitus. It is true that the behaviour of an 'educated' person must be the result of conscious learning. But, according to Bourdieu²⁶, behaviour at any given moment is equally a result of embodied cultural history of intensions and rational calculations. In the present study, teachers represent a society which is overly consumerist and largely has a commodified perception of success and achievement. Nevertheless, habitus is durable but not eternal. Though these conditions are historical, they are acquired through formal and informal education²⁵. New habitus can be formed by transformative practices. Education has the potential to recultivate a habitus of sustainability by showing the difference between 'needs' and 'learned needs'. This will require re-educating teachers in the sustainable ways of looking at success and growth²⁷. To change these deep-rooted habits and beliefs, extensive examination and addressing of these personal and social constructs is required²⁵. Also important is to acquire a critical look towards the policies and personal lifestyles. This can be accomplished through intensive teacher training workshops which provide information and ensure perspective-building among teachers. To mention that training programmes can address this is not to undermine the endurance of our non-sustainable habitus. Our social, political and economic experiences constantly reinforce this structure. Therefore, not just a training programme, but also developing a follow-up mechanism is crucial to establish the new learnings.

Conclusion

The present study was designed to understand the state of different aspects of EfS namely, policies, curriculum and teachers' understanding. The findings suggest that the syllabus and the model textbooks by NCERT do have provisions for teachers to make efforts towards education for sustainability. However, teachers appear to be ill-informed about the various methods and resources to teach about sustainability. On many occasions they were found to be misguiding students about causes and consequences of natural calamities through religious beliefs and myths. The present study is limited by sample size and representation of diverse schooling structures and regions. Therefore, a robust and comprehensive examination is required about teachers' notion about sustainability before generalizing the findings. However, the current findings are corroborated by earlier reports about quality of education in India. It suggests that concerted efforts are required to shape teachers' perspectives towards sustainability who are situated in broader social, economical and historical context.

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