

GANDHI AND THE IDEA OF SUSTAINABILITY– IMPLICATIONS FOR SCIENCE EDUCATION

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The principles of Sustainable Development (as highlighted in the Brundtland Commission*, 1987) entail the conservation of resources for the current and future generations without disturbing the ecological balance. The present paper discusses the role and relevance of Gandhian education philosophy and his vision of a School (at Sevagram Ashram) for sustainable living. The paper further delineates the scope of Gandhian education philosophy and ideals in the present-day context of school education and integrates his philosophy within the prescribed school curriculum. A case of a Class VI science textbook has been taken as an example to review and analyse the curriculum in the light of Gandhian principles and ideas of sustainability for school education. The paper also provides suggestions for further integration of Gandhian values of sustainability and sustainable development within the school curriculum. Educational implications can be drawn for science education in general, as well as for in-service and pre-service science teachers, teacher educators, and science curriculum developers.

Keywords: Sustainable Development, Ecology, Science, Society, Science education, Sustainability.

Introduction

Gandhian Philosophy and principles have inspired millions across the ages, not just for nation-building and resilience but also in spheres such as Education, the employment sector, economy, and industry. However, thinking about the current pace and means of development in the country, it largely appears antithetical to the ideals and values embedded in Gandhian Philosophy and ideology.

As a result of this, we are a witness to a development that is lop-sided and focused mainly on economic and material gains rather than based on human values, conservation

of the environment, and ethics. Such a model of development may be a boost for an economy but can never be long-lasting as it is detrimental to the health of our environment and the fabric of our society. Gandhian principles are based on self-sufficiency, non-violence, truth, and care, cutting across all organisms and the environment.

The Gandhian idea of Education has always been inspirational and pragmatic not just for India but also for the World. Gandhian Philosophy and his ideology have been emulated in Education, development, nation-building, economics, societal fabric, lifestyle, and character building. The values inherent

* The Brundtland Commission 1987 emphasised upon the judicious utilisation of environmental resources such that they fulfill the needs of the present generation and do not compromise on the needs of future generations as well. This is the principle of 'sustainable development' which was the major recommendation of this report.

in Gandhian Philosophy have the power of transforming the World, which we have been a witness to, especially when it comes to the Indian Freedom Movement and the struggle for the rights of South African people. Gandhiji had never tried to influence or ask the people to follow him or his ideals; instead, the people themselves got motivated to adopt them. This is the sign of a true leader, who himself is a model of all the ideals he believes in rather than insisting others follow them. Gandhiji was an epitome of truth, ahimsa (non-violence), honesty, virtue, and peace, and he strived for these ideals for his entire life. In one of the books he wrote, 'my life is my message,' clearly depicts the thought process of his evolution from an ordinary human being to an extraordinary Mahatma. His experiments in Education are somewhat influenced and abridged from the socio-political turmoil that our country was going through during the freedom struggle. His principles in Education were primarily derived from his own experiments and thoughts, initially, at the Tolstoy's farm (in South Africa), also known as the *Satyagraha* institution, where the inmates practiced Satyagraha, truth, and non-violence. Some of the inmates from the farm were Indians and hence returned to India, where Gandhiji established an Ashram at Kochrab, Ahmedabad, in 1915. The Ashram's life was not easy or leisurely as the inmates were expected to practice self-restraint, celibacy (*Brahmacharya*), truth, non-violence (love), peace, offer prayers, use swadeshi products, cleanliness, and kindness. Gandhian ideas are truly apt even today for building a peaceful and harmonious society and for establishing World religion.

Gandhiji had always promoted village industries and propounded a 'craft-centred'

Education System for a self-reliant society, and rejected the use of any foreign products as that would devalue our national products and labour. In Ashrams, spinning and weaving were among the chief activities that every ashramite was supposed to contribute. Spinning meant spinning the wheel (*Charkha*) for making cloth that is indigenous (*Khadi*). Besides, *Charkha* spinning was considered a meditative practice where 3H (head, heart and hand) are actively involved, unlike the English Education System, which aims to develop 'head' only. The significance of village industries in the context of India was put in a paragraph in *Harijan*.

"I would say that if the village perishes, India will perish too. It will be no more India. Her mission in the World will get lost. The revival of the village is possible only when it is no more exploited. Industrialisation on a mass scale will necessarily lead to the passive or active exploitation of the villagers as the problems of competition and marketing come in. Therefore, we have to concentrate on the village being self-contained, manufacturing mainly for use. Provided this character of the village industry is maintained, there would be no objection to villagers using even the modern machines and tools they can make and can afford to use. Only they should not be used as a means of exploitation of others." (*Harijan*, 29-08-1936, p. 226)

The National Curriculum Framework (NCF-2005) envisages the ideals of the Gandhian system of Education, taking as it is from *Nai Talim* (1937). Mahatma Gandhi visualised Education as a means to awaken the nation's conscience to injustice, violence, and inequality entrenched in the social order. *Nai Talim* emphasised the self-reliance and dignity of the individual, which would form

the basis of social relations characterised by non-violence within and across society. Gandhiji recommended using the immediate environment (context of the learner), including the mother tongue (language) and work, as a resource for socialising the child into a transformative vision of society. He dreamt of an India where every individual discovers and realises her or his talents and potential by working with others towards restructuring the World, which continues to be plagued by conflicts between nations, within society, and between humanity and nature (NCF-2005). The idea of *Sarvodaya* propounded by Gandhiji is a sustainable ideal as it subsumes the welfare of all, including the environment, and shuns the role of any external power or discriminatory practice and self-centred pursuits for luxury and material gains.

Gandhiji was a great environmentalist, too, as he always promoted homemade (nation-made) products as opposed to foreign products because they are not meant to suit our body, mind, and environment, and are bound to cause peril. He was against the idea of indiscriminate industrialisation and aping the west. He was also wary of the fact that injudicious use of resources would lead to their depletion and extinction, especially when he said, "the World has enough for everyone's need but not for everyone's greed," pointing toward the exploitative tendency of human beings towards nature and its resources. This is the central idea of sustainable development, as stated in the Brundtland Conference report,

"Humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations

to meet their own needs." (World Commission on Environment and Development, 1987)

The NCF position paper on 'Habitat and Learning' also emphasises the role of Education in promoting sustainable development.

"Education is becoming increasingly central to the development process. It has to help raise awareness and build the capacity of communities to elaborate a vision and participate in the pursuit of environmentally and socially sustainable development." (NCERT, 2006).

The present paper delves into Gandhian ideas and philosophy of a sustainable society and sustainable living. The paper also analyses the present NCERT Science textbooks at the upper primary level from the lens of the Gandhian idea of sustainability and provides suggestions for better integration within the subject and topics given in the textbook.

Gandhian Idea of Sustainable Development

Sustainable Development refers to the principle of meeting human development goals while simultaneously respecting, protecting, and sustaining the ability of natural systems to provide natural resources and ecosystem services to all the people indiscriminately and equitably. In such a society, the integrity of the natural systems is maintained and nurtured. Sustainable Development can be defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Brundtland Report, 1987).

Gandhiji always advocated a minimalistic and straightforward lifestyle, which helped reduce waste and serve the poor in the country. He believed in equality and equitable distribution of resources. Gandhiji emphasised the idea of living in harmony with nature and that nature can provide for everyone's needs but not for everyone's greed (Vijayam, 2004). His idea of *Sarvodaya* emphasised welfare and self-sufficiency for each and every individual, for which he always promoted the idea of village and cottage industries. Besides generating employment for millions of workers, the village industries also promote the use and marketing of nation-based products as opposed to foreign materials. Gandhiji was wary and opposed to too much mechanisation by industries, as that would reduce the value of manual labour and affect the livelihood of many people (Gandhi, 1960). Instead, Gandhiji promoted the wielding of *Charkha* by every individual and every household as a symbol of peace, prosperity, freedom, and self-sufficiency.

"I... claim for the *Charkha* the honour of being able to solve the problem of economic distress in a most natural, simple, inexpensive, and businesslike manner. The *Charkha*, therefore, is not only not useless... but it is a useful and indispensable article for every home. It symbolises the nation's prosperity and, therefore, freedom. It is a symbol not of commercial war but commercial peace. It bears not a message of ill-will towards the nations of the earth but of goodwill and self-help. It will not need the protection of a navy threatening a world's peace and exploiting its resources, but it needs the religious determination of millions to spin their yarn in their own homes as today they cook their food in their own homes.

I may deserve the curses of posterity for many mistakes of omission and commission, but I am confident of earning its blessings for suggesting a revival of the *Charkha*. I take my all on it. For every revolution of the wheel spins peace, goodwill, and love. Moreover, with all that, inasmuch as the loss of it brought about India's slavery, its voluntary revival with all its implications must mean India's freedom." (Young India, 08-12-1921).

The idea of the 'Spinning Wheel' and *Khadi* can also be understood as a means to generate self-employment and dignity of labour. It also helps in conserving a nation's resources and builds cooperation among its people. Gandhiji compared the 'Spinning Wheel' to a life-giving Sun, a precursor to promoting and reviving other handicrafts. Gandhiji was a great supporter of 'Vegetarianism,' and a vegan diet excluding all animal flesh and animal products, and provided a moral basis for the same (Gandhi, 1959). He also argued for animal rights and taking good care of animals in the animal houses (*Gowshalas*).

Looking at the current pace and means of development, adhering to Gandhian ideals and ways of living becomes indispensable and can only provide an alternative path that is less destructive to the environment. It is clear that environment and development can no more be viewed dialectically as both are deeply related to each other and are indispensable for sustainable living. Post-Independence development is often viewed from an anthropocentric viewpoint that needs to be realised in terms of a country's material gains and economic growth, but less viewed from a holistic and integrated perspective, including the social, political, cultural, economic, environmental, and ethical standpoints. The recent environmental crises such as depletion

of natural resources, global warming and climate change, dwindling biodiversity, soil erosion, and land desertification result from the lop-sided model of development that needs to be combated equally by developed and developing nations. The present Education System also contributes to harbouring a self-centred and competitive mindset of the people. Thus, there is a need to revamp our Education System and base it on the Gandhian values and ideals for a better tomorrow, and conserving our environment.

Methodology

The present paper involves a critical content analysis of the Class VI NCERT Science textbook with respect to the integration of Gandhian values of Sustainability. The textbook chapters have been analysed keeping in view the following parameters:

- Topics/content in the textbook that caters to the idea of 'sustainability' or 'sustainable development'.
- Integration of Gandhian values of Sustainability (refer to Table 1) within the Science Textbook of Class VI
- Treatment/presentation of these values in the textbook
- Pedagogical implications for transacting content/topics related to Sustainability in the classroom
- Suggestions for further value addition in the textbook

Integration of Gandhian Ideals in School Curriculum — Content Analysis of Class VI NCERT Science Textbook

Sustainable living is one of the critical elements of the Gandhian philosophy that understands that all live in harmony with nature. Sustainability is also in each of the SDGs (Sustainable Development Goals) for a better world. The Gandhian idea, "Be the change you wish to see in the world," emphasises the value of individual responsibility in changing the current world order and aiming for a better tomorrow. National Education Policy (NEP) 2020 also emphasises instilling the value of sustainable development and living for global citizenship. The policy also reinstates the integration of environment awareness and principles of sustainable development within the teacher education curriculum to sensitise the pre-service teachers toward sustainable development (p. 23). In the light of the above framework, a case example of a Class VI NCERT Science textbook has been taken to understand the integration of the Gandhian idea of 'sustainability' within the curriculum. Class VI Science textbook has been selected as a sample for developing a framework to integrate Gandhian Philosophy and ideals at other levels.

A critical analysis of NCERT Science textbooks from Classes VI – VIII was carried out to identify the topics and areas where Gandhian values and his idea of sustainable

development can be integrated. The matrix (refer to Table 1) presents the Gandhian values found in the literature that can be mapped to the current science curriculum at the elementary school level. The matrix can help the teachers identify the Gandhian values and ideals that they can integrate with their science curriculum topics. For instance, when a teacher is teaching animal kingdoms and the classification of species, at the same time, she can also talk about taking care of animals, especially stray animals, by giving them food and comfort. This will help develop sensitivity among students toward animals in their neighbourhood and develop a feeling of care for them.

A case of Class VI NCERT Science textbook is taken as a case example to explain the process of integrating Gandhian values and ideas within the curriculum (refer to Table 2). The pedagogy easily integrated with Gandhian values could role-play, storytelling approach, field study, watching documentaries and report writing, etc. In addition, Gandhiji emphasised the working of the head, heart, and hand for holistic learning and Education. Therefore, teachers need to integrate all the three elements (cognitive, affective and conative) into their teaching-learning processes.

Table 1
Matrix representing Gandhian values mapped to curricular topics

Skill and manual labour (hands-on activities and Experiments)	Peace (collaborative work in doing science experiments and projects)	Harmony (group activities and Discussion)	Moral development (case studies and storytelling)
Truth (reporting the results of experiments)	Animal care (Species diversity and animal classification)	Environment Ethics (air pollution, water pollution, use of plastics, e-waste, industrialisation)	Character development (helping others learn science concepts, scientific temper)
Non-violence (tolerance for others' views and opinions, animals' rights, human rights)	Sustainability (conservation of resources)	Simplicity (polluting less, reducing carbon footprints)	Lifestyle (healthy diet, regular exercise, reliance on organic products)
<i>Charkha</i> (hands-on science activities and experiments)	Employment (green economy and green jobs)	Self-sufficiency (training in skills such as coding, experimentation, artificial intelligence, etc.)	Equity (contribution of rich and poor in the share of Carbon footprints and Carbon emissions)

Self-restraint (adopting a balanced and healthy lifestyle)	Equality (science education for all students irrespective of their caste, class, gender and socioeconomic status)	Freedom (conduct innovative science experiments and projects, report and share the findings)	Conservation of resources (judicious utilization of natural resources)
<i>Sarvodaya</i> or Social Welfare (science and scientific practices for community welfare)	<i>Swaraj</i> or decentralised power (democratic practice in science to arrive at logical solutions to given problems)	3Rs- Reduce, Reuse and Recycle (waste management, conservation of resources)	<i>Swadeshi</i> or local goods (developing technology locally in the country and promoting skill development in the country)

BOX 1: Classroom Discourse on Conservation of Resources

Teacher: Which is your favourite dish?

Student 1: I like dal

Student 2: I like rice with sambar

Student 3: I like cauliflower vegetable

Student 4: I like scrambled egg

Teacher: Do you know from where these food items come?

Student 4: From a poultry farm

Student 5: From daily store

Student 6: From the fields

Student 7: From grocery shops

Teacher: Yes, you are right; our food grains come from the fields while eggs come from the poultry farm. But, do you know who grows the food grains for us and takes care of the poultry?

Student 1: The farmers grow the food grains for us

Student 3: The animal breeders take care of the poultry farm in producing eggs

Teacher: Do you know some people cannot get enough food? What could be the reasons for it?

Student 4: Food items might be costlier for them to purchase

Student 6: They might not be having jobs to earn money and buy food

Student 8: They are not able to avail of the Government's subsidized ration scheme

Student 10: There might be too many members in a family to feed and not enough resources

Teacher: Yes, you all are right; there could be different reasons for people not being able to feed themselves and their families adequately, but one of the primary reasons is 'Poverty.' This could lead to malnutrition and many deficiency diseases.

However, is there any way through which we can help in reducing the shortage of food and solve the problem of hunger?

Student 2: By reducing wastage of food

Student 4: By buying food only as much as we want and not hoarding food items

Student 5: By donating excess food to people who cannot afford

Teacher: You are right! We should conserve the resources and utilise them judiciously to make them available and accessible to everyone. This is also known as the concept of Sustainability.

While teaching about food and its sources, a teacher can refer to the NCERT Science textbook of Class VI (p. 2, Activity 3 and Table 1.3) and can initiate a discussion around the quality of food items, problem of food scarcity, and hunger in the country, working of the PDS (Public Distribution System), issue of access to quality food by the poor, and malnutrition. A discussion could be initiated in this regard (refer to Box 1).

Another example from the same textbook is the chapter 'Fibre to Fabric' and the importance of hand-woven fabrics and *Charkha*. Here, the teacher can discuss the process of making fabric from fibre and how *Charkha* became a national movement in India, leading the country toward self-sufficiency in terms of cloth making. The following excerpt from the Class VI NCERT textbook (refer to NCERT Science textbook for Class VI, p. 21) can be taken as a starting point for initiating the Discussion.

"Use of *Charkha* was popularised by Mahatma Gandhi as part of the Independence movement. He encouraged people to wear clothes made of homespun yarn termed as *Khadi* and shun imported cloth made in the mills of Britain. To popularise and promote *Khadi*, the Government of India constituted a body called *Khadi* and Village Industries Commission in 1956." (NCERT Science Textbook for Class VI, 2006)

Here, teacher can actually begin with the activity of making a model of *Charkha* in the classroom and ask the students to do the same. This will help understand the working of *Charkha* and the coordination of their head, heart & hand (3 'H'). The storytelling method can also be integrated by narrating the story of *Charkha* (refer to Box 2) while teaching about the process of making fabric from fibre.

Box 2: The Story of *Charkha*

Charkha or the spinning wheel is one of the essential landmarks in India's freedom struggle initiated by Mahatma Gandhi.

During the rule of the East India Company, the British used to ship raw material (cotton) from India to England and then used to sell the finished products (fabric) in India at exorbitant prices that led to enormous losses for Indian farmers and commoners. At this time, Mahatma Gandhi introduced the 'Swadeshi' movement by taking up *Charkha* and asking Indians to weave their cloth. This cloth woven from the spinning wheel came to be known as *Khadi* or *Khaddar*. This marked the beginning of the Indian Spinning Industry.



Source: https://commons.wikimedia.org/wiki/File:Charkha_kept_at_Gandhi_Ashram.jpg

In Mahatma Gandhi's view, *Charkha* constitutes a movement that will revive the cottage industry in India, which will alleviate poverty. The message of the spinning wheel is to replace the spirit of exploitation with the spirit of service. Weaving *Khadi*, according to Gandhiji, is an honourable occupation to earn bread and has a far greater value as an instrument of winning *Swaraj* through non-violent means.

There are many other chapters in the textbook where Gandhian values of Sustainability could be integrated (refer to Table 2). However, it is essential to note here that there could be varied pedagogical approaches to integrate the Gandhian values seamlessly within the curriculum. A teacher needs to be cognisant of the relevant examples, activities, and contexts for developing an integrated lesson plan with Gandhian values. Educators could be engaged with sustainability education much more by incorporating examples from

local culture, natural resource issues, and economic possibilities for connecting their students more deeply with their community and place (Smith, 2010). Sustainability education needs to be dealt with holistically while adopting an interdisciplinary approach that includes concepts, evidence, controversy, values, and devising solutions to complex problems (Hill, 2005; Summers et al., 2005). Students can also be encouraged to take up short-term projects to deal with an issue related to sustainability.

They can also document certain traditional practices and folklores that inherently promote sustainable development. Sustainability education should pervade all aspects of school education, be it curriculum, pedagogy, physical surroundings, and

infrastructure, as well as partnerships with the local community. The approach to be adopted for integrating sustainability education includes intra-subject delivery, cross-curricular delivery, and the organization of special events (Buchanan, 2012).

Table 2
Content Analysis of NCERT Science Textbook of Class VI for the integration of Gandhian Values

Chapter No. and Title	Topic/Task/ Figure/ Exercise (page no.)	Content/ Theme	Gandhian Values integrated	Suggestions for value addition (based on Gandhian idea of Sustainability)
1. Food— where does it come from	Food materials and sources (p. 2) Table 1.3 Things to think about (p. 7)	Sources of different food materials, both plants and animals Does everyone around you get enough food to eat? If not, why?	Harmony & tolerance Equity and equality	The Gandhian value of giving importance to 'vegetarianism' and including more cereals and pulses in our diet can be integrated here. Likewise, the ethic of conservation of plants and animals can also be integrated here as the need to take care of animals in breeding houses. The question integrates the value of the equitable distribution of resources (food items) for sustainable living and eradicating hunger.
3. Fibre to Fabric	3.4 (spinning cotton yarn) p 21 Project (p. 24)	Spinning of fibres into yarn Visit a nearby handloom or powerloom unit and observe the weaving or knitting of fabric.	<i>Charkha</i> and the value of self-sufficiency	The section talks about the Gandhian <i>Charkha</i> movement in India. He also emphasised the value of wearing homespun cloth <i>Khadi</i> and shunned the use and buying of foreign fabric. A field visit to a nearby <i>Khadi</i> Industry can be organised where the students get an idea about the process of spinning and the fabric of <i>Khadi</i> .

5. Separation of substances	5.1 (Methods of separation)	Handpicking, threshing, winnowing, sieving, sedimentation	These manual methods generate employment for village people and help them attain self-sufficiency	The Dandi March (salt satyagraha) can be included under the evaporation/sedimentation of salt as a movement to make India self-sufficient and independent.
7. Getting to know plants	Fig. 7.13 (p. 57)	Watering and tending of plants	Taking care of plants	Students can be encouraged to plant more trees to preserve the environment and generate awareness about cutting down trees.
14. Water	Table 14.1 (p. 136) Boojho: Regions having a low supply of water (p. 137) Paheli: two glasses of water are required to make one page of a book (p. 137)	Estimation of the amount of water used by a family in a day Unequal distribution and availability of water	Conservation of water Equitable distribution of resources Conservation of resources	The activity helps give an idea about the total water consumed and wasted in a day. It can help develop sensitivity among the learners towards the conservation of resources such as water. A discussion can be initiated on these points in the class to emphasise upon judicious utilisation of resources.
16. Garbage in, garbage out	A step towards cleanliness (p. 155) Fig. 16.2 16.2 Vermicomposting (p. 158)	Government of India <i>Swachh Bharat</i> mission Managing garbage	Cleanliness and hygiene Value of manual labour and clean environment	The chapter emphasises the Gandhian ideal of cleanliness and how to make our surroundings clean.

Discussion

The importance of sustainability in education and curriculum has been greatly emphasised worldwide (Jones, Selby, and Sterling, 2010; Ryan, Tilbury, Corcoran, Abe, and Nomura, 2010; Velazquez, Munguia, and Sanchez, 2005). The present study provides a perspective on Gandhian values of Sustainability and sustainable development. Gandhiji always emphasised a closer integration of schools and community to develop the sociological aspect of a child's nature and encourage a cooperative mindset (Bala, 2005). Thus, teaching science integrated with Gandhian values for sustainable living will help mobilise the communities toward the idea of 'sustainability' and sustainable living. The Gandhian idea of sustainable development aims at reviving the traditional and indigenous knowledge systems such as cloth-making using *Charkha*, making 'salt' by using traditional methods of separation, which help generate employment opportunities for the rural poor. This helps in reducing the gap between the rich and the poor. There could be many such case examples and anecdotes from the Gandhian era that could be added to the textbook or curriculum to emphasise the idea of 'sustainability.' Gandhiji always stressed skill-based and experiential learning rather than rote memorisation of concepts (Sykes, 1988). Therefore, science teaching and learning in schools need to reorient itself toward skill-based learning and preparation for the nation's future workforce. This has been highlighted by National Education Policy (NEP)-2020* and is one of the sustainable development goals (SDGs) for a self-reliant India.

The Gandhian idea of sustainable development and value framework can be integrated into many topics of science and technology for developing an interdisciplinary perspective among learners as well as inculcating values through science. For instance, while teaching the topic, 'Garbage in, Garbage out', the values of cleanliness and hygiene can be integrated through various activities.

Gandhian ideals, such as, democracy, equality, honesty, cooperation, and care for living beings constitute the core values for human beings and for building responsible citizenship. These ideals, when integrated with the curriculum through various activities and collaborative projects, help in nurturing such values among students. The Gandhian ideology of promoting the local handicrafts and cottage industries helps generate rural employment and sustainable living without polluting the environment. The skill of making cloth on a *Charkha* is a natural way of cloth weaving and fabric production and is sustainable too. Similarly, the value of conservation of natural resources such as water, coal, petroleum, etc., also helps build a sustainable future. Integrating the Gandhian idea of sustainability and sustainable development provides an interdisciplinary perspective to science teaching and learning. Science need not be taught as an objective and value-free subject; rather, values can form an integral part of science teaching and learning. Assessing the impact of new technology on society and the environment provides an interdisciplinary perspective to science teaching and learning; for instance, Genetically Modified crops and

*The original reference was Draft NEP-2019 but by the time of publication of this issue, NEP-2020 was published and hence modified accordingly.

their production in India have been a reason for great debate and furore owing to their unforeseen impact on the soil, environment and human body, and also being a reason for farmer distress in India.

The present study highlighted the significance of Gandhian values in the science curriculum through science textbooks. A critical content analysis of the Class VI NCERT Science textbook revealed the integration of Gandhian values of Sustainability infused seamlessly in different chapters and topics. However, there is scope for further emphasis on these values and ideals in the science curriculum. The role of the teacher is also predominant in modeling such values for sustainability as well as in designing activities based on 'sustainability' and 'sustainable development'. Some suggestions for additional activities within the science curriculum are provided in the paper (refer to Table 2).

Implications for Science Education

The analysis of the Class VI NCERT Science textbook reveals that the Gandhian idea of Sustainability has been integrated into a few chapters but can be emphasised more through additional activities and classroom discourses. A similar exercise can be carried out in other textbooks as well. This analysis has suggested that Gandhian ideas can be integrated into the science curriculum to

provide a value-based framework and fulfil the sustainable development goals (SDGs) for Education. Gandhian Education is on the lines of sustainability education, which is also one of the essential recommendations of the National Education Policy (NEP)-2020*. The integration of Gandhian ideals within the science curriculum will not only inculcate the idea of sustainability among the young generation, but will also help in developing a value-framework for science teaching and learning. This would help in character development and nation building as emphasised by various national education policy documents such as National Education Commission (1964–66), National Education Policy (1986), etc. The students will be able to appreciate their own culture, its practices, and some sustainable traditional practices. Students and their teachers will also engage with the larger community outside their schools, which can benefit through certain co-designed activities and projects. The community-based approach as well as integration of head, heart, and hand envisaged by Gandhiji's Basic Education Scheme (1937) is completely aligned with the activity-based approach and problem-solving approach practised in science teaching learning till date. The teachers need to adopt more collaborative pedagogical approaches in their teaching plan so as to instill among their students a spirit of cooperation, tolerance, and peace for building a sustainable society.

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