

Pedagogical, Curricular and Technological Approach to Education for Sustainable Development



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Abstract

In today's world where every society is in rat race of overexploiting the earth's natural system of resources in order to become more developed, is a situation like growing thistles and expecting for pickles in future. In order to develop sustainable societies and spreading awareness about sustainable development, education seems more promising. For inculcating sustainability in our attitudes there is need to transform education and for this teacher education institutions can play important role by changing teacher development process, so that such societies can be established and flourish. Sustainable development as we know refers to accomplishing the demands of current generation without compromising the needs of generations to come. Education for sustainable development (ESD) refers to a holistic and an integrated procedure of ensuring every student to gain knowledge, acquire skills, attitudes and values required for sustainable development. It is imperative to focus on how to teach Education for Sustainable Development (ESD) and how to assist learners to achieve goals of sustainability. So present paper has tried to comprehend different methods of creating more sustainable society, addressed different ways to integrate and embed ESD into the curriculum, and how technology can offer new hopes to promote the changes in education paradigm required for ESD.

Keywords: Sustainable Development, Education for Sustainable Development

Introduction

Education for sustainable development (ESD) is a holistic approach of developing knowledge, attitudes, skills and values with an aim of developing sustainable world, with enough resources for present and future generations of all living beings on our planet. In order to develop such sustainable societies there is need to improve the quality and content of education including more sustainable practices in pedagogy and addressing sustainability in curriculum and spreading mass awareness and imparting training to stake holders from different sections of society. Literature reveals a number of definitions of sustainable development and there are different views on the concept of education for sustainable development. So for education for sustainable development ways for attaining and promoting sustainability among cultures and societies is more important than mere teaching the content of sustainable development. The primary objective of ESD is to enable every member of society to acquire relevant knowledge and skills that motivate him/her to practice sustainability in day to day life. Education for Sustainable Development (ESD) can achieve its aims by:

1. Developing feeling of respect towards environment among learners and preserving the past achievements;
2. Enabling the learners to appreciate the nature and living beings on our planet;
3. Motivating learners to work for developing a world wherein all living beings have sufficient resources for healthy and productive life;
4. Facilitating learners to assess and restore the condition of earth;
5. Capacitating more and more citizens who care about and practice their responsibilities towards environment at local, national and international level.

After gaining the insights about importance of ESD next question that strikes is how to inculcate ESD and how to teach learners to achieve

goals of sustainability. Presently there are three main factors that are providing shape and driving education

1. More demand for sustainable educational pedagogies and approaches ensuring development of sustainable society.
2. Need of transforming and restructuring the curricula to address sustainability
3. Evolving and propagating Information and Communication Technologies (ICTs) for sustainable development.

Aims of the Study

So present paper has been structured in order to fulfill following aims-

1. To explain different teaching and learning strategies that lead to sustainable development.
2. To discuss curriculum that may contribute to sustainable development.
3. To elaborate the role of technology in education for sustainable development.

Teaching and Learning Strategies for Sustainable Development

There are no specialized methods to impart education for sustainable development but as per aims of ESD it is felt that there are certain methods that are better than others. The main focus on ESD is on achieving the aims so as per the aims these methods can be tailor made to fit a teaching learning situation. Some of the methods that are considered appropriate are as follows-

Story Telling

Story telling is there in our education system from Vedic period till today and storytelling is more of a skill and an art than a pedagogical method. A good story presented in an interesting way not only entertain the learners but also hold their attention and can also help in developing several attitudes, concepts and skill. Nowadays storytelling is gaining importance in the area of ESD. Educators are working out ways in which this art can be utilized to explore important shared themes and visions. This method is closely related to environment concerns and issues as in every society we can find a number of folktales describing relationship between man and nature. Stories can motivate learners to adopt sustainable practices, to develop appropriate attitude towards our nature and planet. Stories can also facilitate more practical solutions and insights for our environmental problems.

Experiential Learning

Learning is permanent change in behavior among learners based on their experiences and building critical opinion on those experiences. This pedagogical approach is student centered that put on learners in higher cognitive abilities of critical thinking, problem solving and decision making in their personal and relevant contexts. This method actively engages the learner by providing them with opportunities to elaborate, reflect, consolidate and apply their ideas and skills to novel conditions.

Values Education

Values in simpler terms refer to worth of any thought or action. Values are socially approved ideal patterns of behavior. Through values goodness and badness of a thing is judged. Values contribute to the

affective domain of human behavior. For educating sustainable development values need to be focused as they are inherent in the concept of sustainable development. In case of complex subjects having interdisciplinary nature (like sustainable development), one's behavior is not only influenced by the facts but methods based on active values can be used to find out views, attitudes, opinions and values. For value education value clarification is used that helps in pinpointing how these values can be developed and changed and how new perspectives are acquired and communicated. Learner and the process of learning are of utmost importance when working with values. Every culture has its own value system that promotes sustainable development and there are some universally approved values, but like education for sustainable development there is lack of universal model of values for sustainable development. For value education care should be taken to respect the values of participants or learners and no one should feel inferior during the process. There are situations where some local values are in contradiction to environmental needs but the need to change it must come from within the participant and should not be forced. Value education can use methods that develop critical thinking and group decision making through information sharing and spread of awareness.

Enquiry Learning

One of the main objectives of ESD is to promote abilities of critical thinking, problem solving and decision making among learners in context of environmental issues. Enquiry learning method facilitates development of these important lifeskills. This method promotes higher order cognitive skills placing learner in the centre of learning process. These lifeskills can be developed through enabling learners to analyze, discover, solving problems and other creative activities either in classroom or community. The main approach in this method is to make the learners accountable for their data analysis and decisions made.

Learning outside the Classroom

One cannot think of Education for sustainable development within the boundaries of classroom for facilitating ESD Learning outside the classroom is very important method. This method as the name suggests, involves taking learners to natural settings ranging from school grounds to national park. This method promotes appreciation for nature among learners and provides hands on experience to them that assist in learning of higher quality. This method accommodates a number of opportunities for learners to enquire, analyze and clarify values and to practice higher order cognitive skills as discussed above. For making this method really effective there is need of planning and executing it carefully anticipating all risks involved and addressing them appropriately.

Community Problem Solving

Community Problem Solving is a method wherein learners get opportunities to find out solutions of local environmental issues by practicing sustainable skills. This method is really helpful in developing citizens of aspired sustainable societies.

This method blends experiential and enquiry based approach to harmonize skills for learners. For enabling learners to prepare action plan for sustainable future this method incorporates skills in the planning of values clarification and values analysis.

Future Problem Solving

Future Problem Solving is a procedure that assists learners to analyze a given problem. This method involves six step process that enable learners to make decision in context of future planning and assisting them in working out a practical solution of problem in hand. These steps are as follows –

1. Identification of genesis of problem and its effects
2. Identification of elemental problem
3. Working out probable solutions
4. Establishing benchmarks for evaluation of solutions
5. Finding out the best solution
6. Evolving an action plan

This pedagogical approach not only facilitate higher order cognitive skills among learners but also make them concerned about future and improve their abilities to carry out research, team work and interpersonal skills.

Curriculum of Education for Sustainable Development

The three areas in which sustainability is concerned are environment, society and economy. For ensuring effective education for sustainable development there is demand to restructure the curriculum by distinguishing and integrating knowledge, attitudes, values and skills adhering to sustainable development. It is imperative to select what different sustainability concerns will become part of curriculum for ESD and the criterion for this decision can be environmental priorities or national and local needs of the community. The curriculum so designed must be locally relevant and worthy for communities as this is going to meet the needs of environment, society and economy of these communities. ESD can be embedded and integrated into the curriculum in different ways. Curriculum for ESD mainly falls into one of the following categories:

1. Sustainable Development is fully integrated into the course.
2. Sustainable Development is mentioned in a particular module of the course.
3. Sustainable Development is not mentioned but teacher can see where it might fit.
4. Sustainable Development cannot be easily integrated within the course.

Most commonly ESD courses actually is either taught as a separate topic or teacher decides it to teach as per their convenience as it is not mentioned in course. So it is high time to have retrospective view to train our teachers to find out opportunities to integrate the sustainability in any related topic directly or indirectly related to the theme of sustainability. If sustainable development is not explicit in curriculum, there is no need to look for topics like pollution, solid waste management, biodiversity in different subjects. Unlikely scientific and

vocational subjects it is supposed to be difficult to integrate concept of sustainable development in Mathematics, Languages or philosophy. Concepts of pollution, waste management etc are not directly related to the nature of these subjects but options are there to embed sustainability in teaching learning process. Some of these options are like -

1. For language teaching a teacher can motivate learners to differentiate between different writing styles for newspapers, magazines, journals, reports published by government and business articles. For this comparison text related to sustainable development can be used.
2. Students should be encouraged to write essays, draft applications and official letters related to some environment issues.
3. Mathematics teaching can accommodate problem solving based on environmental data or analysis of trends using weather data or temperature.
4. For Philosophy teaching teacher can motivate students to analyze and synthesize views of different philosophers on contemporary environmental issues and reviewing the development of environmental thinking.

For effective curriculum of ESD there is a need to motivate and reinforce different subject teachers to adopt their teaching process in line with sustainability. For this to happen there is urgent need to introduce this concept of sustainable development and concept of education for sustainable development in pre service and in service training courses. Each subject is different from other and there is no common method to introduce sustainability in them, so teachers are trained in this direction to use their creativity and innovativeness in embedding sustainability in their teaching learning process. Teaching sustainable development is not an easy job because it is a concept that is based on abstract theories and mere chalk and talk methods and rote memorization will not serve the purpose. Curriculum for ESD must address the principle of activeness on the part of both teacher and students. Effective curriculum for ESD must provide students with relevant knowledge, skills, values and train them to live in a sustainable manner to spread sustainability among others to develop sustainable societies.

Research needs to be carried out in different communities to determine the level of ESD for that community to attain sustainability. To realize the concept of sustainable societies effort should be done to integrate formal, informal and non formal modes for evolving an effective ESD curriculum for members of all age, interest and abilities. ESD for different communities will face different problems and questionable practices that need to be addressed with further research in the area.

Role of Technology in Education for Sustainable Development

Today technology is flourishing in every area, and education is also not an exception. In simple words technology in teaching learning mean presenting the content with the aid of multimedia and easy archival of the content as and when required.

Besides presentation technology also opens new avenues of interaction and simulation making teaching learning process better and interesting. For ESD the use of technology bring new potentialities and hopes to achieve the goals of sustainability. Use of technology in educating people to live sustainably not only transformed the learning process but also brought about several challenges about which number of extensive researches and debates are going on. Technology facilitates education for sustainable development in two fold ways as described below:

1. Multiplying ways to access content on sustainable development worldwide.
2. Assisting new approaches of interaction facilitating information sharing, problem solving and decision making among learners.

Technology has potential to build up learning environment that supports interaction, conference and observation among learners worldwide to promote actions and practices for sustainable future. Technology can be used in education for sustainability in following ways:-

Means and Gateways for Educators to Knowledge Reserves

Today use of internet and information and communication technology has opened new gateways and access to education material on sustainable development. Technology has also flourished new platforms for teachers to exchange their views, data, findings, articles learning modules for facilitating education for sustainability. It almost goes without saying that the internet provides extensive links to information on ICTs in education; platforms for educators to exchange knowledge, read and publish articles and lesson plans; and connections to support materials for ESD. There are number of portals on internet from where anyone can get information and content material supporting sustainable development, and the information that one find is from all around the world.

Supplements to Teaching Learning Situation

As in the earlier section of this paper this has been mentioned that for achieving goals of ESD different methods can be used to promote higher order cognitive skills, technology supplements ESD through promoting experiential learning, simulating real time environmental issues with less or no risk involved. Internet has now transformed our globe in to a village with larger information sharing and it has now made it possible to think of sustainable society globally. Today learner can expand his or her area of learning from classroom to globe as now learner contact educators, experts from different parts of world with different cultural contexts. There are several websites on net where collaborative learning is being facilitated. One such website is ePals which is the largest online global community with more than 325,000 teachers and 126,000 classrooms in over 200 countries and territories. This website provides blogging software and an e-mail program, live classroom collaborations and discussions, best-practice examples of classroom use, and tools for searching projects and connecting with classrooms and finding communities. In this way new

communities totally meant for sustainable development can be promoted for ESD.

Multiplying The Means of Non Formal Education

Since ESD involves persons of all ages only formal education modes will not serve the purpose, it has to be supplemented with nonformal modes also. Nowadays technology has provided several ways for non formal education like online learning, e learning, distance learning, open learning. The differences among these learning ways based on the media involved in learning. Online learning is learning mediated through the use of internet. E learning is more comprehensive than online one and it is facilitated with the use of different off line electronic mediums as CD ROMs. Distance learning is further comprehensive than both prior ones as it not only uses online and offline electronic mediums but also non electronic media like printed material. Open learning is a kind of online learning where learners have free access to the courses and contents. All of these modes of learning are suitable for programmes of ESD. ESD via non formal modes based upon increased access, continuous learning, addressing individual differences and needs to develop knowledge, values, skills and attitudes required for sustainable societies. There are a number of universities and institutes all around the world that offers courses on sustainable development through distance learning. For example, the United Nations Global Virtual University (GVU), through its network of universities and institutions, offers a fully online Master's degree in Global Environment and Development Studies that is structured to enable the learners to address different environmental concerns with relevant knowledge, values, skill. In the area of non-credited training, UNESCO's Open Training Platform also working for providing non free non-certifying courses and training resources from over 600 different development institutions worldwide in 21 key domains for building local capacity and promoting sustainable development.

Conclusion

To progress towards sustainable societies, inhabitants need to learn and practice sustainability in their day to day ventures. Education for Sustainable Development is about enabling learners to constructively and creatively address present and future global challenges, involving higher order cognitive skills and work for creating more sustainable and resilient societies. In order to achieve objectives of ESD there is need to transform education to address sustainability and to develop relevant knowledge, skills, values and attitudes towards sustainable development. There is need to reorient teaching methods, curriculum, teacher training and technologies supporting ESD.

References

1. Brundiars, K., Wiek, A., & Redman, C. L. (2010). *Real world learning opportunities in sustainability: From classroom into the real world, International Journal of Sustainability in Higher Education, 11(4), 308-324.*
2. Cruickshank, H. J., & Fenner, R. (2012). *Exploring Key Sustainable Development Themes*

- through Learning Activities. *International Journal of Sustainability in Higher Education*, 13(3), 249-262.
3. Cramer, J. & Zegveld, W. C. L., (1991). *The Future Role of Technology in Environmental Management*, *Futures*, 23(5), pp. 461.
 4. UNESCO. (2005). *Contributing to a More Sustainable Future: Quality Education, Life Skills and Education for Sustainable Development*. Paris: UNESCO. <http://unesdoc.unesco.org/images/0014/001410/141019e.pdf> (accessed 16 Sep 2016)
 5. Pass, L. (2008). *How Information and Communication Technologies can support Education for Sustainable development: Current Uses and Trends*. Retrieved from: <http://www.iisd.org>. (accessed 23 sep 2016)
 6. UNESCO. (2006). *Education for Sustainable Development Toolkit. Learning & Training Tools No1*. <http://unesdoc.unesco.org/images/0015/001524/152453eo.pdf>
Also available online in html at <http://www.unep.org/Documents.Multilingual/Default.asp?documentid=78&articleid=1163> (accessed 20 sep 2016)
 7. UNESCO. (2006). *Storytelling. Teaching and Learning for a Sustainable Future, version 4*. http://www.unesco.org/education/tlsf/mods/theme_d/mod21.html (accessed 20 sep 2016)
 8. United Nations Department of Economic and Social Affairs. (2009). *Division on Sustainable Development. Sustainable Development Topics* http://www.un.org/esa/dsd/susdevtopics/sdt_index.shtml UNESCO. 2005. *UNESCO & Sustainable Development*. http://unesdoc.unesco.org/images/0013/001393/1393_69e.pdf (accessed 21 sep 2016)
 9. UNESCO. (2010). *ESD Lens Review Tool 9 ESD integration in the curriculum. ESD Lens: A Policy and Practice Review tool. Learning & Training Tools, No. 2*. <http://unesdoc.unesco.org/images/0019/001908/190898e.pdf> <http://www.esdtoolkit.org> Rio Declaration (accessed 20 sep 2016).