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The NCERT encourages original and critical thinking in education. The JIE provides a forum for teachers, teacher educators, educational administrators and researchers through presentation of novel ideas, critical appraisals of contemporary educational problems and views and experiences on improved educational practices. Its aims include thought-provoking articles, challenging discussions, analysis, challenges of educational issues, book reviews and other related features.

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JOURNAL OF INDIAN EDUCATION

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CONTENTS

Editor's Note

"Education is not limited to imparting of the information or training of skills. It has to give the educated a proper sense of values"

—Dr. S. Radhakrishnan

The importance of inculcating values through the educational process has been a much discussed issue worldwide. This has been reflected in reports of various committees and commissions on education in India also. These reports have emphasised the role of education in different ways, such as 'character development', 'bringing out the latent potentialities and inherent qualities' and developing an 'integrated personality' for the well-being of the individual and the society at large. In spite of these recommendations and systematic efforts to inculcate values, our society by and large, still faces the issue of constant erosion of essential values, such as moral, ethical, humanistic, spiritual, etc. The type of pedagogy to be used in the classroom for inculcating different values in an integrated manner has to be practiced by the teachers and teacher educators. The present issue of the *Journal of Indian Education* discusses some of these issues and other concerns in school education through articles and research papers.

The most appropriate pedagogy for inculcating values among our children is the integrated approach. Albert Ferrer through his analytical paper outlines how Steiner and Montessori suggested and practiced pedagogic innovation which strongly speaks for the humanistic foundation of education and even to the extent of spiritual. The author also compares those pedagogical innovations in comparison with the pedagogical practices followed in the ancient Indian *gurukul* system. Shalini Yadava discusses the issue of care and empathy in student-teacher relationship. She provides insights into the strategies and activities which may be used with students in order to inculcate these values, thus analysing the philosophical ideas put forward by Nel Noddings. T.P. Sarma and Komal talk about teacher's perception regarding inculcation of values in students, while teaching the subject of mathematics. The paper explains that only a resourceful teacher of mathematics, with effective planning make it possible for the students to attain the values.

The *National Curriculum Framework (NCF) 2005* advocates the importance of using appropriate pedagogy that can facilitate the learner to construct knowledge. Arunraj and M. Suganthi, through their empirical paper discuss one such pedagogical tool. They explain cartoons as a pedagogic tool for helping in constructive engagement and dissemination of knowledge among students. Stuti Srivastava, through her paper talks about students' understanding of Nature of Science (NOS). In her paper 'Chemical Reaction' has been modified

to explicitly teach four aspects of NOS—the empirical nature of scientific knowledge, the creative and imaginative nature of scientific knowledge, the tentative nature of scientific knowledge and scientific inquiry.

The importance of technology in teaching learning and assessment has been to be an important feature of twenty-first century. V. Ramadas through his analytical paper seeks to deconstruct the myth regarding ICT in educational practices. His paper creates awareness among the educators and researchers about how beliefs and views on ICT in education are built. The paper reflects that there is a need to critically consider to what extent such beliefs and views have rational and evidence-based grounding.

'Education for All' is an aspiration and commitment of India since the inception of the Constitution. Union government with the support of the state governments has been instrumental in realising this vision through various flagship programmes. Two papers in this issue discuss this concern. The research paper by Elizabeth Gangmei and Gowramma look at the challenges faced by minority education institutes in Odisha. The authors concentrate on the various bottlenecks faced by the Muslim and Christian minority schools at the elementary levels. Pankaj Kumar in his paper talks about special schools for visually impaired students. The author explores the role and importance of such schools.

Rajanna Muravath and A. Sadanandam take a look at school dropouts using linear multiple regression method on cross section data of Telangana and Andhra Pradesh (the combined Andhra Pradesh) for the year 2013–14. They also identify various factors which influence the dropout rate. Chandra P.B. Singh analyses the district level Educational Development Index of Bihar. His paper depicts that though Bihar has not achieved the desired level of quality education, yet the state is determined to change towards a better future.

An empirical paper by Aneeshya P., examines the perception of higher secondary school teachers on the impact of anthropogenic global warming. The paper depicts that higher secondary school teachers have average perception regarding the impact of anthropogenic global warming on environment and also there is a difference of perception between science and non-science teachers regarding this issue. Charu Smita Malik focusses on the behaviour and practices of school head as leaders in bringing community participation in the context of framework of School Leadership in the national policy discourse.

The issue ends with a book review by Ramanujan Meganathan of a recently published book titled *Drought But Why? How India can Fight the Scourge by Abandoning Drought Relief* by Richard Mahapatra and Snigdha Das.

Academic Editor

Ethics within a Spiritual/ Metaphysical World View towards Integral Value-based Education

European Educationists: Steiner and Montessori

Albert Ferrer*

Abstract

Among the Western pioneers of integral value-based education, two authors deserve special attention in Europe: Steiner and Montessori. This paper outlines a common underlying background in both of them—Philosophical Idealism and Theosophy. According to the author, it is this special idealistic sensitiveness that compels the two renowned educationists to react against the technocratic and utilitarian mainstream school system and suggest new avenues for the pedagogic practice in a holistic, humanistic and even spiritual horizon which overcomes the valueless soulless patterns of modernity. If mainstream schooling is based upon a certain world view, which is materialistic and mechanistic, Steiner and Montessori's pedagogic innovation is based upon another world view, which is humanistic and spiritual. In spite of different paths in professional terms and different personal contexts, they both put forward the same fundamental pedagogic principles deriving from this common underlying paradigm. From this point of view, the needed caution from mainstream schooling while approaching their philosophy of education should not overlook the contribution that they have made and they still can make to transform the educational system for better.

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Introduction

It is commonly agreed that Steiner and Montessori would be the pioneers of integral or progressive pedagogies in Europe, and Dewey and Kilpatrick in North America. This paper tries to expound the main points of Steiner and Montessori's pedagogic innovation which strongly makes the case for the humanistic foundation of education — and even spiritual. At the same time, it shows that there is a common background in Steiner, Montessori and even Dewey — philosophical idealism, which induces the three of them to react against the mainstream school system, essentially technocratic and utilitarian like the civilisation that has produced it. It is this special idealistic sensitiveness which propels these major figures of holistic or alternative education to open new avenues in front of the alienating reductionism operated by modern schooling.

The progressive pedagogy of the European pioneers — like that of the North-American precursors would be deeply akin to the integral value-based philosophy of education of Indian sages, such as Vivekananda, Tagore, Aurobindo, Krishnamurti or Sathya Sai Baba. Unfortunately, the Western world has massively ignored the contribution of India, not only in the educational sector but also in general. That is why the renowned scholar, Prof. R. Panikkar, always denounced the cultural imperialism of the West while claiming for an intercultural dialogue that has been rare till now.

In fact, the European pioneers of integral education have also been ignored in their own continent for many decades. From a sharp hostility at the beginning towards an initial aperture in the last years, the educational philosophy of Steiner and Montessori is still revolutionary — in the deepest sense because the mainstream system still goes in the opposite direction — as a reflection of the whole civilisation. There are more Waldorf and Montessori schools today, and some governments have paid more attention than others to their proposals.

But in general terms mainstream schooling is still what both Steiner and Montessori denounced, and their pedagogic innovation is still valid and it is still waiting to be seriously implemented in the whole educational system — not only in a bunch of private Waldorf or Montessori schools. This may require adaptation, flexibility and prudence; still there is something in both Steiner and Montessori that is important for the whole educational system, not only for a minority of special parents searching for something different for their children.

The most important today would be the deeper message of Steiner and Montessori's pedagogic and philosophical insights. And this is what we try to elucidate in this paper. Certainly, these renowned educationists have had some influence on Western educational systems, and a number of schools

have been created following their inspiration. Nevertheless, we must acknowledge that the mainstream school system has not changed in significant terms yet — especially in Europe; it is still basically academic and utilitarian, and ultimately technocratic; it continues to structure a sharp reductionism in front of the multidimensional nature of humanity and the cosmos. From this point of view, European and Western educational systems are still essentially modern, that is, materialistic and technocratic, not holistic yet — as quantum physics would certainly prefer. In this horizon it may be stated that something 'pour epater les bourgeois': integral education is quantum whereas mainstream schooling is Newtonian. There is something epistemologically profound in this philosophical provocation. In Steiner's words:

"Individuals are seldom brought into touch with their own humanity.

Anthroposophy, which is based on a real and comprehensive understanding of the human being, would hear this heartfelt appeal coming from all sides.

When we have genuine knowledge of a human being we see that he or she possesses three clearly distinguished members: physical body, soul and spirit."[1]

In this heartfelt appeal, Europe is probably more reluctant than North America to open the mainstream system to holistic or progressive pedagogies. For this reason, we must say today that the pedagogic innovation of Steiner and Montessori, like that of Dewey and Kilpatrick, is still a source of inspiration in order to transform the mainstream educational systems from technocracy and utilitarianism towards a more holistic, humanistic, ethical and even spiritual vision of education and hence humanity.

In this perspective, the notion of paradigm is essential to grasp not only all the depth of Steiner and Montessori but more specifically their criticism of mainstream schooling and hence their alternative proposals. As already mentioned, their philosophical background would be Philosophical Idealism in general and Theosophy or the Theosophical Society in particular — from which Steiner withdrew to create his own frame and organisation, Anthroposophy. This is particularly important to understand their pedagogic innovation.

Let us take experiential learning for instance. In the modern world it would be usually understood in cognitive terms only — see Dewey for instance; but for Steiner and Montessori, as it was for Socrates and Plato, as it would be for all Theosophists, experiential learning has another deeper dimension beyond the mere cognitive level, which is metaphysical and spiritual: know yourself and you will know the universe and the gods.

[1] Steiner R. 1997. The Roots of Education (Foundations of Waldorf Education). pp. 13–14. Anthroposophic Press, New York.

Here Theosophists, such as Steiner or Montessori would be deeply coherent with the Vedic education of India and the Vedantic '*gurukula*'— community of master and disciples exemplified by Shankara and his disciples — something deeply akin to Platonism by the way.

Steiner makes it clear that modern civilisation is based upon a materialistic world view deriving from scientism rather than science. In front of this, his world view is spiritual and metaphysical, and he is aware of the gap between the society and himself.[2]

"The world is permeated by spirit, and true knowledge of the world must be permeated by spirit as well."[3]

Precisely for this reason academic or governmental reports that do appreciate positive aspects of Waldorf education are still cautious when facing the possible implementation of Waldorf strategies into the mainstream sector. This kind of report manifests the matter of the paradigm or world view, which is not at all the same in Waldorf schools and in mainstream schooling.

For instance, the report of the University of West of England on Waldorf education warns:

"Adoption of Steiner practices in mainstream education has to be approached with caution. Transferring practices between schools of differing philosophies is neither straightforward nor in all cases appropriate, and may not achieve the expected consequences because they are removed from the supportive school context in which they originate.

Transferring practices between schools of differing philosophies of education means in depth in philosophical terms transferring practices of differing paradigms or worldviews.

Steiner and Montessori defended an integral form of education from another paradigm, let us call it metaphysical or Idealistic — form Philosophical Idealism and Theosophy; certainly not from the materialistic and utilitarian world view prevailing in the modern age. We want to insist on this crucial issue in this paper as we have done in other works through the study of integral philosophies of education both in the West and the East.

We also want to make it clear that philosophically the deeper background of Steiner and Montessori would not be Theosophy but Philosophical Idealism, this Philosophia Perennis that Huxley studied in his famous works and fascinated major quantum physicists — especially in its Indian Vedic formulation. Some limitations may be found in the concrete contents of modern Theosophy, but this is not the real matter. The fundamental issue at stake is the epistemological and metaphysical depth of Philosophical Idealism — both Socratic/Platonist or Vedic/Vedantic, or in any other tradition or school of thought. It is this philosophical depth what

[2] Cf Steiner R., 1997, p. 13.
[3] Steiner R., 1997, p. 29.

brings quantum physicists to the convergence of science and spirituality. It is not a matter of religion — in the orthodox sense and even less in the mere sociological meaning; it is a matter of reality, and this is what quantum physics and other branches of new science have realised — see relational science, new biology, epigenetics, sophrology, etc.

While elaborating a new educational project for 20 years between India, Europe and North America, which is called "International Education for a New World", the author of these pages has studied the educational philosophy of the pioneers of integral value-based education in Europe, North America and India, especially from this philosophical background provided by Philosophical Idealism. He has also visited many schools implementing their pedagogic proposals in the three continents. In this article the author tries to bring out his observations and conclusions from 20 years of field work together with the more scholarly research and philosophical work hoping that the readers will find it inspirational or useful to strive towards a more humanistic kind of education.

As Kant emphasised, education is a historical process. Integral value education is even more clearly a collective endeavour that constitutes in fact the very process of human evolution, or to put it in Aurobindo's words, the adventure of consciousness on Earth.

The Heirs of Theosophy

Rudolf Steiner and Anthroposophy /Waldorf Schools.[4]

Rudolf Steiner (1861–1925) is a fascinating figure of the twentieth century, philosopher and educationist, member of the Theosophical Society and later founder of Anthroposophy and Waldorf Schools, probably the most mature project of integral education in the Western world with a wide scope of implementation (around 2,500 schools including kindergarten). Through Theosophy he was in fact an heir of Goethe, Romanticism and the long tradition of European Philosophical Idealism going back to Plato, Pythagoras and Orphism.[5]

- In the first phase of his life and work, more philosophically oriented, Steiner attempted a synthesis between science and spirituality also outlined by the forerunners of quantum physics in the West and Swami Vivekananda in India. Through his spiritual science, Steiner tried to provide a connection between the cognitive path of modern science and the Socratic/mystical quest of Philosophical Idealism and spiritual philosophy.
- In the second phase, starting around 1907, he collaborated in a diversity of artistic media, developing the dance called 'eurythmy' and built the famous

[4] It is important to note that few critical biographies and scholarly works have been published about Steiner apart from the hagiography characteristic of Anthroposophical organisations or Waldorf Schools.
[5] Cf Ullrich H., 1994.

Goetheanum, a cultural centre for all the arts.

- In the third phase, beginning after the First World War, he established different practical endeavours, like biodynamic agriculture, anthroposophical medicine and mainly Waldorf Schools. Steiner became the Head of the German and Austrian sections of the Theosophical Society in 1902. Quite soon, some differences manifested between Steiner and the Society.
- First, the Theosophical Society had a broad open spirit open to intercultural dialogue, and made an invaluable contribution towards a reappraisal of Hinduism and Buddhism in a colonial era that had despised these major spiritual traditions — the most prominent figures of Theosophy even supported the independence of India. Steiner's worldview was limited; without much interest in the Eastern traditions, he rather closed himself within the limits of the European esoteric tradition and Christianity exclusively.
- Secondly, the leaders of the Society, A. Besant and Ch. Leadbeater, recognised the purity and the depth of a young boy from Madras Beach, J. Krishnamurti. Though their expectation for the young boy to become the vehicle of an immortal master, Maitreya, and a World Teacher were not totally or exactly accomplished, still their intuition was basically sound. The older Krishnamurti always recognised as his contacts with the Masters had been totally real, and nobody can deny that J. Krishnamurti became one of the most brilliant philosophers and sages of the modern age, a true spiritual master Malgre Lui, and finally a real world teacher, though not in the way the Society had initially thought of, but in a purely Socratic way, that is, the most genuine. However, Steiner was pretty Eurocentric, and could not so easily accept an Indian boy becoming the World Teacher. This illustrious thinker and educationist could not be aware of his own limitation from this point of view, which implied an unconscious adoption of the cultural imperialism of his age.

Steiner formally cut with the Theosophical Society in 1912/1913, and formed a new organisation, Anthroposophy, where Steiner could feel at ease becoming somewhat the pope of his own church, centred on European culture and Christianity, without Besants or Leadbeaters reminding him about other spiritual traditions like Hinduism or Buddhism, and without Indian boys being candidates to such high positions as World Teacher.

In any case, he pursued the typically theosophical search for the fulfilment of spiritual life. Like the Romantics, Steiner suffered from the demystification of the world operated by the modern age.

"The central theme of Steiner's work is the inner perception of the spiritual world and the spiritualisation of every area of human activity."[6]

In 1919, Steiner founded the first Waldorf School in Stuttgart. At the same time, he lectured more than ever, and the Goetheanum expanded its cultural activities. In 1923, he founded the School of Spiritual Science, intended to be "the soul of the Anthroposophical Society". After the First World War, he proposed radical social reforms, namely his famous Threefold Social Order, in which the cultural, political and economic realms would be largely independent, whereas, according to Steiner, their fusion had generated inflexibility leading to the catastrophe of World War I.[7]

From 1919/1921, the new National-Socialist Party (Nazi) rapidly gained strength in Germany, and its leaders, such as Adolf Hitler and Dietrich Eckart, started attacking Steiner. Apparently, it was an obvious cultural gap between them that produced the Nazi aggressiveness. In depth, Hitler was convinced that Steiner had supernatural powers — oriented towards the light, while the Nazi leader was very interested in getting such kind of powers but in a totally opposite orientation, towards dark forces. This sinister spectrum of German politics and culture declared a 'war against Steiner'. The Goetheanum was burnt, and Steiner's lectures were object of violent assaults amidst threatening.

After a long period of illness, Steiner died in 1925, leaving a fascinating life devoted to spiritual philosophy, a new holistic paradigm and integral education. He was also one of the first intellectuals to seriously warn Germans and Europeans about the danger of Hitler and National-Socialism; his warning was more than justified with all what developed after his death.

Steiner's Integral Education: Waldorf Schools

Already as a young man, Steiner defended the independence of educational institutions from governmental control. In 1907, he wrote an essay on "Education in the Light of Spiritual Science", where he described the major phases of child development that would later become the very foundation of Waldorf's pedagogy. In 1919, Emil Molt invited him to lecture to his factory in Stuttgart, the Waldorf-Astoria cigarette factory. Out of these lectures came a new school, the first Waldorf School, pioneer of a movement that amounts to circa 2500 schools and kindergartens at the beginning of the twenty-first century all around the globe.

In 1922, Professor M. Mackenzie invited Steiner to present his pedagogic ideas at the famous Oxford University, which would launch the creation of Waldorf Schools in the United Kingdom.

"In contrast to the path taken by Dewey and Montessori, who sought to establish their New Education

[6] Ullrich H., 1994, p. 2.
[7] Cf Steiner R., 1995, p. 7.

on recent ideas of empirical child psychology, Steiner based his educational plan entirely on his cosmic spiritualistic anthropology."[8]

Main Features of Waldorf Education

- A humanistic approach;
- Integral or holistic pedagogy;
- Child-centred and value-centred philosophy;
- The basal role of ethics in education;
- Interdisciplinary spirit;
- Emphasis on the pedagogic potential of all the arts and
- Stressing the role of imagination and creativity.

Steiner aimed at the formation of free moral integrated human beings in front of the reductionism and mechanism of mainstream schooling. Freedom applies not only to the children, but also to the schools and the teachers, who have a considerable amount of freedom to define the curriculum.

"Waldorf educators are particularly concerned with the development of the soul of the school-age child."[9]

Steiner's Model of Child Development

- **Early childhood (from birth to 7),** when learning is basically experiential, sensory-based and imitative through playing.
- **Elementary school (7 to 14),** embracing late childhood and puberty/early adolescence.
- **During late adolescence, after 14, the secondary school's pedagogy** can develop conceptual/abstract thinking and moral judgement, though it has already been prepared through the elementary school, especially after 11.

Most of Waldorf schools are autonomous institutions that do not follow an official curriculum. In spite of inevitable problems with the perennial will of governments to control education, Waldorf schools have been able to survive and develop, offering one the most comprehensive and mature systems of integral education in the Western world.

And despite being so different from mainstream schooling, Waldorf schools have been increasingly appreciated at the scholarly and even governmental level.

As the study made by the University of Arizona concludes:

"The empirical research on Waldorf education is surprisingly limited given its nearly 100 years history. However, the available studies suggest a positive impact of Waldorf on a number of cognitive and social outcome measures."[10]

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[8] Ullrich H. and Rudolf Steiner. 1994. Prospects. *The Quarterly Review of Comparative Education*, UNESCO. Vol. XXIV. No, 3/4, pp. 5–6.

[9] Uhrmacher P.B. 1995. Uncommon Schooling. A Historical Look at Rudolf Steiner, Anthroposophy and Waldorf Education. Curriculum Inquiry, University of Toronto. Vol. 25. No. 4. p. 10.

[10] A.L. Larrison, A.J. Daly and C. Van Vooren. 2012. "Twenty Years and Counting. A Look at Waldorf in the Public Sector Using Online Sources." *Current Issues in Education.* Arizona State University. Vol. 15. No. 3. p. 2.

M. Montessori's Schools

Maria Montessori (1870–1952) was an Italian physician and educationist who developed a special pedagogic system, the Montessori Method, as an attempt to provide a more integral and humanistic kind of education in reaction to the mainstream school system or her time — and to some extent of ours too.[11]

Montessori's pedagogic system arises from realising what is "the child's true normal nature". From this point of view, Montessori develops on modern academic grounds one of the major themes anticipated by Rousseau and the Romantics. Montessori observed with a scientific eye what happens when young children are given freedom in an environment prepared towards their self-directed learning. Hence, the method aims at reproducing through a pedagogic frame that is experimental observation, to unfold in the school their true natural way of being – called **"normalisation".**

"Montessori borrowed the term 'normalisation' from the field of anthropology. It is a technical term which means "becoming a contributing member of society" (...) According to Montessori, the phenomenon of normalisation refers to the process of healthy development whereby children regularly and freely choose constructive activities based upon their interests, which then leads to their development of the capacity to concentrate (...) she believed that this state was "the true nature of the child".[12]

- In this pedagogic system, the main role of the teacher — sometimes called guide — consists of removing the obstacles interfering with this natural development of the child and his or her natural inclination towards their own self-directed learning process.
- Another main function of the 'guide' would be to carefully observe the children in their own developmental process. The teacher must believe in the child.
- The teacher will also provide lessons, where he or she will show how to use the various self-teaching materials or will correct any kind of misbehaviour.
- The teacher — compared to a gardener takes care of the child as a soul.

In general, the Montessori Method has been basically implemented with young children (till seven), though some pedagogic application has also occurred with elder groups of age.

In terms of history of educational philosophy, we can understand

[11] Cf Bagby J.H. 2007. "Montessori Education and Practice. A Review of the Literature. 1996–2006", *Montessori Life*. Vol. 16. No. 1.
Bagby J.H. and N. Jones. 2010. "Montessori Education and Practice. A Review of the Literature. 2007–2009", *Montessori Life*. Vol. 22. No. 1.
Bagby J.H., K. Wells, K. Edmondson and L. Thompson. 2014. "Montessori Education and Practice. A Review of the Literature. 2010–2013", *Montessori Life*. Vol. 26. No. 1.

[12] Lloyd K.M. 2008. "An Analysis of Maria Montessori's Theory of Normalization in Light of Emerging Research in Self-Regulation". Thesis, Oregon State University. pp. 17–18.

Montessori's reaction against the mainstream schooling of her time — and partly today which overlooked the nature of the child and the characteristics of the different age groups, while imposing from college down to primary school the lecture method on purely academic grounds.

However, the development of educational philosophy will have to examine with a sensible mind whether Montessori's innovation does not sometimes fall into the opposite extreme — some of her followers rather than herself, which may bring to an erosion of the pedagogic role of the adult. Mankind always shifts like a pendulum from one extreme to another. Montessori's method should invite educators to find a middle path between the overwhelming imposition of the adult — as in the modern mainstream schooling and the dismissal of the adult's pedagogic role — as it has sometimes happened in the last decades under an aura of progressive pedagogy. Montessori herself insisted that children need a structured pedagogic environment, and she felt that Rousseau did not understand it properly and hence misunderstood the child's freedom.

When dealing with Montessori's succession, it is important to make it clear that the Montessori Method does not constitute a trade mark for which it has been adopted by a diversity of organisations differing in their interpretation and implementation.

Montessori borrowed the experimental method called Scientific Education, which was developed in the nineteenth century by the French physicians Jean-Marc Gaspard Itard and Edouard Seguin. Dr Itard became famous for trying to educate the wild boy from Aveyron and worked with handicapped children; Dr Seguin continued his work and developed especially designed self-teaching materials. Both Itard and Seguin were important for the treatment of mentally impaired children, and Montessori followed them in her research on mental retardation. In front of the brutal treatment that mentally handicapped children received at that time, Montessori defended after the two French physicians a more pedagogic and more humane policy towards these children. In fact, it was her study of children's mental illnesses that motivated her to study education in general.[13]

In 1907, she established a care centre for young children in a low-income district of Rome. In this Casa dei Bambini — Chidren's House, she put into practice Seguin's method, and soon realised the positive results. From this experience she wrote several books and conducted training programmes. At the end of her life, she explored how her method could be extended to secondary education and even college.[14]

Although Montessori evolved her method from direct experience and

[13] Cf Gutek, G.L. 2004. In Montessori M. (ED.), The Montessori Method, ed by G.L. Gutek, Rowman and Littlefield, New York, p. 710.
Cf Montessori M., 2004, Chapter 2.

[14] Cf Montessori M., 2004, Chapter 3.

from scientific research, not from any philosophical background or specific theory, it is clear that her pedagogic orientation is deeply akin to Rousseau and the philosophical school of Naturalism among the major trends of educational philosophy. She got acquainted with the more progressive philosophy of education, especially Rousseau, Pestalozzi and Froebel, and she did value their contribution, but still she was not totally satisfied with them.

"As she became more knowledgeable about these important educational theories, Montessori recognised their value but also found them scientifically inadequate. Through promoting children's dignity and freedom, she found that Rousseau, Pestalozzi and Froebel had relied on a philosophical, rather than a scientific, view of children."[15]

Like Steiner, and also like Kant, Rousseau and Hegel much before, Montessori reacted against the reductionism and mechanism of mainstream schooling, with authoritarian and repressive traits at that time — much sharper than today. From this historical point of view, Montessori decisively contributed to the pedagogic innovation of the modern age towards a more humanistic and integral kind of education.

At that time, the most influential progressive philosopher of education in North America was Dewey, and it is interesting to note that Dewey's heir, Kilpatrick, strongly criticised Montessori instead of valuing her. We could be surprised at Kilpatrick's hostility against Montessori by keeping in mind their common progressive reaction against the rigidity and dehumanisation of mainstream schooling. But this common general background should not overlook existing differences amongst these pioneers of progressive education. We might tend to oversimplify things just by thinking that all of them were progressive educationists questioning mainstream schooling. In spite of this, they worked from different perspectives on different paths, and they were not free from their egos like other mortals. Kilpatrick was clearly dominating the educational scene in North America with other progressives when Montessori went there, and maybe it was his typical human nature that did not allow him to fully recognise the value of Montessori's contribution, which he certainly diminished.

Quite far from Kilpatrick's pragmatism, the Montessori Method designs a curriculum that stimulates the inner plan of nature and encourages the child's own natural inner guidance — which is one of the major themes of Philosophical Idealism. For Montessori, the child is God, and first and foremost the teacher must regard the child as a soul.

Apart from the connection with Rousseau and Naturalism, there is a profound relation between Montessori

[15] Gutek G.L., in Montessori M., 2004, p. 11.

and Philosophical Idealism, which can be biographically explained through her interaction with Theosophy and the Theosophical Society, one fundamental aspect of Montessori that has been often ignored by many of her followers — due to their materialistic bias consistent with the prevailing world view.

On the other hand, this 'esoteric' dimension of Montessori brings her closer to Steiner and his Waldorf Method — in depth. Both were Theosophists and both had this metaphysical and spiritual, we could say mystical worldview, so different from the predominating ideology in the modern age. From this point of view, both the Montessori and the Waldorf Method are deeply coherent, although we should not deny either, that Montessori and Steiner followed very different paths in spite of this common philosophical background.

It is not so well known that Maria Montessori was a member of the Theosophical Society — like Steiner. Some prejudiced persons have fiercely denied that Montessori was a Theosophist, while the evidence is undeniable in the archives of the Theosophical Society. The same prejudice has brought some people to push Montessori's acquaintance with Theosophy at the end of her life, while the existing records show a much earlier bond. In conclusion, Montessori had been related to Theosophy when she was much younger than presumed by many, and she formally became a member — which has been denied by many. In any case, anybody who earnestly examines her life and work must acknowledge that her scientific method is not incompatible with a profound spiritual sensitiveness, which she prudently dealt with in the European cultural context. For Montessori, the teacher is the protector of the child's soul.

At the end of her life, she could closely collaborate with the Theosophical Society in its world headquarters in Adyar, Chennai. Initially invited by the Society in 1939, she had to stay much longer when the Second World War broke out — she was from Italian origin and India was a British colony, for which she was treated as an 'enemy' and was interned there. The Theosophical Society adopted her method for its schools, and Dr Montessori was active in lecturing and training. Her humanistic contribution to pedagogy is deeply coherent with Philosophical Idealism, and hence Theosophy.[16]

From the rich life and extensive work of the founder, the Montessori Method provides a wide range of pedagogic materials that stimulate the child's interest and his or her self-directed activity. For the youngest children (birth to six), for whom the method was originally designed, these pedagogic materials are organised into five categories:[17]

- Practical life
- Sensorial

[16] Cf Wylie W., 2008, "Montessori and the Theosophical Society", "Quest", March–April 2008.

[17] Cf Larrison A.L., Daly A.J., C. Van Vooren and Lillard A.S. 2013. "Playful Learning and Montessori Education". *American Journal of Play*. Winter 2013.

- Language
- Maths
- Cultural

A More Detailed Study of the Pedagogic Practice

Montessori, Waldorf and the Socratic Method (the Indian *Gurukul*)

Montessori designed her method basically for young children, since the method itself developed from the observation of small kids. Adolescence and secondary school — from 11 onwards is another world. And she was aware of it though she left it quite unexplored — probably it was not her task, she already did a lot.

Montessori schools have institutionalised this small children's ethos — though Montessori herself was open to the adaptation of her method to adolescence. If you browse through the net about Montessori Schools you will massively see small children, not adolescents. This dominance of the small children's ethos in Montessori Schools conveys a very real danger in pedagogic terms, since our whole civilisation already produces a structural infantile treatment of adolescence — which is inseparable from the destruction of initiation cultures, and which is also connected to Michel Foucault's repressive strategies of modernity.

The typical Montessori classroom — as advertised by Montessori schools is suitable for kindergarten and the first years of primary school — may not be so suitable for the end of primary schooling and certainly not for the higher classes. As we said, puberty and adolescence is another world. Moreover, the real anthropological differences in learning between the two genders should be incorporated — which has not been the case till now though it is empirically obvious that they exist.

Apart from being a space for small kids, the typical Montessori classroom is also a women's domain from which men are visibly absent — which constitutes one of the most dramatic trends of our civilisation, the lack of men in education, directly linked to the world crisis of boys' education, because boys obviously need male teachers as role models.

After Montessori's innovation, most of the schools bringing her name became a world of ladies taking care of small kids. The very image of Montessori schools — see most of videos and photos on the net shows that only; adolescents are absent and male teachers almost not visible. Where are the specific needs of adolescents? Where are the specific needs of boys who need role models of their own gender? That is why there is a world crisis of boys' education that is not tackled yet. Education is much more than women with small kids; there are the older age-groups, there are anthropological differences between boys and girls, and the male gender also must be totally involved in education; everybody with common sense — which has been lost by the

way will agree that the growing boy needs the positive role model of his own gender.

Both Piaget and Steiner understood the profound differences between the age-groups and the features of each. From 8 onwards and especially from 11 onwards, and even more from 14 onwards, the deeper meaning of pedagogic principles, such as experiential/self-learning or child-centred education must be implemented in ways that are different in practice. But the very image of Montessori Schools in the net seems to ignore the older age-groups from puberty on and their specific pedagogic needs. Steiner was aware of it, and the Waldorf Method designed different pedagogic strategies for the different age-groups while paying attention to the higher classes. Other educationists have also taken into account the necessary pedagogy for adolescents; on the other hand, the Indian *Gurukul* — like the Socratic dialogue and method is suitable for adolescents, not for small children. Here the presence of male teachers becomes still more important than in the lower grades, especially for boys; it is anthropologically evident that boys need positive role models of their own gender to grow up in a balanced way.

The educational systems must fully comprehend the significance of the different age groups — which Piaget studied in detail, and Steiner incorporated more clearly than Montessori in his Waldorf Method. From this point of view we believe that the Montessori Method is more suitable for kindergarten and primary school — especially till 7/8 while the Waldorf Method can bring valuable insights for the older age groups/ adolescence — which does not mean that Steiner did not pay attention to the lower grades.

Still, educational systems should value and integrate both Montessori and Steiner in an open spirit, not in dogmatic terms, which means that they should be open to other contributions too. We should not forget that Froebel already anticipated many insights of Montessori. Moreover, we should not ignore the fundamental reflections of the great philosophers of education — from Plato to Rousseau, Kant and Hegel, unknown to most of progressive schools; and we should not forget either the grand tradition of the Indian *Gurukul* and the major educationists of India — that do not exist in the mind of most of Montessori or Waldorf teachers. We do believe that there is something fundamental in the Indian *Gurukul*, in Vivekananda, Tagore, Aurobindo, Krishnamurti or Sathya Sai Baba, that Montessori or Waldorf Schools are overlooking whereas they could learn a lot from it — the same would apply to Plato and the Socratic Method.

Montessori made a crucial contribution to education in the modern age — herself more than her followers; Steiner too. To start with, we should combine both instead of

sticking to one of them only. And both must be complemented by other philosophers of education and other pedagogic traditions in an open spirit, not in dogmatic terms. Only this wider perspective with aperture of mind can solve the problems of education in the world and open new avenues for a better future. This is what the educational systems should try to do in the future.

The ideal synthesis for the future of education could be a combination of the Montessori Method for small children (in an open way) and the Socratic Method (parallel to the Indian *Gurukul*) for adolescence — while integrating other valuable contributions, such as the Waldorf Method, and needless to say, the major philosophers of education of the West together with the great educationists of India, totally ignored by Western cultural imperialism.

When implemented in adolescence, the Montessori Method becomes the Socratic Method, which we can also find in the Indian *Gurukul* — the Upanishadic dialogues are deeply coherent with the Platonic dialogues. The pedagogic principles beneath both Montessori and Socrates — and Steiner are the same: self/experiential learning, child-centred and holistic education, etc., within a metaphysical/spiritual vision. Not by chance Montessori was a Theosophist — like Steiner and Socrates is the model for Western Philosophical Idealism. We should keep in mind that Steiner was a Platonist — through Goethe. This is the underlying philosophical paradigm for integral education.

We can draw a more detailed model of human growth in parallel to the major pedagogic methods:

- *Kindergarten:* Montessori Method (always in an open not dogmatic way)
- *Primary school:* Montessori and Waldorf Method (with other sources)
- *Middle school:* Waldorf and Socratic Method – the Indian *Gurukul*
- *Higher secondary:* The Socratic Method – the *Gurukul*

Education should integrate all the valuable contributions from both the West and the East while taking into account the developmental process. As Kant said, education is a historical process towards to human emancipation.

Last but not least. Both Montessori and Steiner were Theosophists.

Where is the spiritual dimension of the child/adolescent in most of Montessori Schools and even in some Waldorf Schools? Many Montessori Schools have forgotten adolescents and also male teachers. They have also forgotten the spiritual dimension of the child, which was certainly present in Montessori's vision — she was a Theosophist like Steiner. Her philosophy of education incorporates a metaphysical or mystical dimension: the Child as a Soul.[18]

But many Montessori Schools — and even some Waldorf Schools too share the materialistic bias of modern civilisation and become an integral

[18] Cf Montessori M., 2004, p. 127 and p. 262–264.

part of it — they are the cheerful face of this civilisation, but still they share the same paradigm in depth.

The genius of Montessori — or Steiner has been diluted by their followers, as usual in human history; the human condition has not changed yet.

While working on integral education for 20 years in three continents we have continuously heard the question: How do we do it? Parents and teachers are obsessed by the techniques and it seems, to many, that the key to the Montessori or the Waldorf Method lies in the technique. We have always responded that this state of mind corresponds to the technocratic mirage of our civilisation. The key to the Montessori or the Waldorf Method, the key to integral education, does not lie in the technique but in the intention, in the state of consciousness. What is common to all progressive educationists would be the pedagogic principles; all of them have understood and defended the same pedagogic principles in spite of the different perspectives and paths in their respective lives and careers. If a teacher or a parent understands these pedagogic principles, he or she will do it, and may even recreate new practical ways to implement it. Whereas if you do not understand the pedagogic principle and you just mechanically implement a set of techniques you will reproduce the mainstream system without being aware of it. Krishnamurti made profound reflections on this crucial issue, but few listened to him. People are usually attracted by techniques while few really tackle the issue of conscience. Montessori was aware of it and warned about it, but her words have been forgotten behind the paraphernalia of techniques and material.

"It is my belief that the thing which we should cultivate in our teachers is more the spirit than the mechanical skill of the scientist; that is, the direction of the preparation should be toward the spirit rather than towards the mechanism, said Krishnamurti."[19]

The Montessori Method

From anthropological research, M. Montessori observed children in natural settings, such as home, playground, etc. She concluded that children grow and learn from inside out — which not only Piaget but also Philosophical Idealism would endorse, from Socrates to Vivekananda.

There is a natural development of the child, which the educational process must respect.

Children learn of their own accord, and teachers or parents must nurture this natural process through their loving and prudent guidance.

An excess of external inducements — as in mainstream schooling produces dependence on authority and need of approval.

"The school must permit the free, natural manifestations of the child if in the school scientific pedagogy is to be born."[20]

[19] Montessori M., 2004, p. 73.
[20] Montessori M., 2004, p. 74.

- *Conventional schools:* children are forced to learn and need incentives to learn. If they do not respond they are punished. Punishment and prize are inseparable from forced unnatural effort.
- *Montessori schools assume the opposite:* children do not need to be forced to learn; they are naturally interested in learning.

Still, we must be aware that M. Montessori did not arrange a legal trademark or brand name — whereas R. Steiner did which means that anybody can use Montessori's name quite freely — whereas it is legally not possible under the names of 'Steiner' or 'Waldorf'. This is the reason why there are around 2,000 Waldorf Schools in front of around 20,000 Montessori schools. On the other hand, there can be very different interpretations of the Montessori Method — which may have pros and cons in front of the standardisation of Waldorf Schools through the educational franchise — which again may have pros and cons.

The three foundations of the Montessori method:

- The normalisation of the child's natural development
- To cultivate the autonomy of the growing child as a subject
- To educate the whole child – integral education

According to M. Montessori, the classroom environment must be arranged so that it facilitates interaction and experience through activities — amongst children themselves and between child and teacher.

Children must be able to move around and interact amongst themselves and with the teacher; pedagogic materials must be easily accessible.

The classroom is not run by the teacher unilaterally — as in mainstream schools but experienced by the children under qualified freedom — freedom for the child to learn by himself or herself under the caring guidance of the adult.

Montessori stressed that the classroom environment is as important as the teacher.

"The novelty lies, perhaps, in my idea for the use of this open-air space, which is to be in direct communication with the schoolroom, so that the children may be free to go and come as they like, throughout the day. (...)

The principal modification in the matter of school furnishings is the abolition of desks and benches or stationary chairs."[21]

Many Montessori classrooms look pretty original — a large space where all children move around selecting educational materials under the observation and guidance of teachers. Whereas some Montessori classrooms — especially with older children look more conventional with desks in front of the blackboard — and here the Montessori Method is also implemented in some way.

Mixing age-groups: elder students as mentors to the younger and leaders.

The younger see what the elder are doing and seek for explanations.

[21] Montessori M., 2004, p. 120.

These are naturally given, which is highly educational for the young ones. At the same time, the elder are happy to teach what they know and this is also educational for them.

Teachers should not face the children frontally all the time but move around the classroom to pay an individual attention to students one by one or in small groups.

The teacher must follow the child, instead of the child following the teacher.

The teacher is a guide.

Experiential Learning

The school must teach basic skills, such as reading, writing, arithmetics, etc., but basically through educational activities with a practical dimension that affects life and which is meaningful to children. To learn by doing.

Teachers must give to students constructive and practical tasks to complement mere intellectual learning from outside — given by adults.

"The pedagogical method of observation has for its base the liberty of the child; and liberty is activity."[22]

- Bio-sciences teaching becomes a naturalistic inquiry, raising questions from experience with the world.
- Physical sciences might be taught through practical application.

For small kids **play-way methods** are more suitable, since playing constitutes the natural way of learning for the young child. Montessori schools have developed many practical play-way tools and educational toys — which are in fact as old as mankind; two centuries back Froebel already designed educational toys for young children.

Self-learning

Adults must give a chance to the children to learn on their own. Children must be self-motivated and find their own interests.

Teachers must allow students to choose what they want to learn and then guide them. When the child exhibits interest in learning something, he or she must be guided by the teacher in his or her own learning process.

According to Montessori, life is based on choice. So children must learn to make their own decisions. They must choose and decide in their own educational process. Learning through obedience to external commands is contrary to life. Imagination awakens the natural interest of the child. "It is true that some pedagogues, led by Rousseau, have given voice to impracticable principles and vague aspirations for the liberty of the child, but the true concept of liberty is practically unknown to educators."[23]

"Discipline must come through liberty. (...)

If discipline is founded upon liberty, the discipline itself must necessarily be active."[24]

Together with free choice through individual or group projects, children

[22] Montessori M. 2004, p. 124.
[23] Montessori M., 2004, p. 74.
[24] Montessori M., 2004, p. 124.

must be taught self-responsibility through practical tasks while taking care of the educational tools, materials and space.

The pedagogic practice must allow children to see a bigger picture of knowledge and their own process of learning, so that they can take ownership of their education, which fosters the child's natural desire to learn.

This can be facilitated when younger students observe what elders are doing by mixing the age groups.

Mental activities and higher functions are connected to physical movement; it is aberrant to force children — and even more boys to sit down in front of a blackboard for the whole day — as in mainstream schooling. The learning process requires freedom of movement and the natural movement of the child.

We must set the energy of the children free. Freedom of education means freedom for the creative energy, which is the urge of life towards the natural inner development of the individual.

However, there must be some organisation in the school. Freedom does not mean lack of organisation. Freedom requires a structured environment. Organisation is necessary for children to work freely. It is also important that the school/ classroom incorporates plants and animals; the contact with Nature is fundamental in education.[25] Children must work in the garden and observe Nature directly; there can even be plants in the classroom. The contact with animals is also highly educational; it has been proved that many psychological troubles improve through it — see for instance the experiments with equino-therapy.

While giving freedom to the child and allowing self-learning, the teacher must provide material means, guidance and understanding. The teacher's role is indispensable. Hence, teachers should not apply non-interference when children behave in naughty ways; then, they must stop them and make them realise what they are doing so that they positively transform themselves — which is something very different from negative criticism or coercive punishment.

In the Montessori classroom materials are organised into five areas:[26]

- **Practical life:** this kind of material and exercise enhances physical coordination, self care and care of the environment. There are also lessons about polite manners too.
- **Sensorial:** this kind of material is used in activities and exercises for children to experience the natural world and the physical environment, including shapes, colours, etc. Here, Montessori borrowed many ideas from Dr Itard and especially Dr Seguin with their scientific education.

[25] Cf Montrssori M., 2004, Chapter 10.

[26] Cf Larrison A.L., Daly A.J., van Vooren C. and Lillard A.S., "Playful Learning and Montessori Education", *American Journal of Play*. Winter 2013.

- **Mathematics:** this kind of material shows basic concepts like addition, subtraction, multiplication, division, numeration, value, etc. A famous Romantic pedagogue, Froebel, was probably the first educator to design educational play-way material — known as Froebel's gifts.
- **Language:** this kind of material provides experiences through various exercises to develop the basic skills of reading and writing.
- **Cultural subjects:** this kind of material allows children to learn cultural subjects like geography (map puzzles, globes, etc.), history and science (for instance, naming and organising plants or animals). Music and art are also incorporated in different ways.

These five domains would be complemented by other activities, namely the various artistic disciplines, performance, gardening, activities into Nature, games and sports, etc. For the earlier stages Montessori attached a great importance to sensory training.[27]

Many videos are available in the net showing a diversity of materials from the five areas and how they work. Needless to say, Waldorf Schools utilise similar tools; other educational organisations and some commercial companies have also produced this kind of educational toys, which Froebel already anticipated two centuries back.

The materials must be easily accessible to the children in furniture especially designed for them — not for the adults.

The utilisation of the materials by the children allows self-learning, experiential learning and problem-solving. This pedagogic practice is obviously child-centred, and teachers move around like the children themselves paying individual attention to them one by one or in small groups.

The Waldorf Method

Unlike M. Montessori who focussed on young children only, R. Steiner draw a whole map of human development through stages and elucidated the pedagogic principles and tools of education at every stage. Year by year the Waldorf system prepares the growing child for the next step through a scaffolding of human growth parallel to pedagogic practice carefully designed by Steiner — something that Montessori, in spite of her valuable contribution, did not do. Through this process, Steiner underlined the interdisciplinary nature of knowledge.

We do appreciate the remarkable contribution of Steiner — like that of Montessori. Both were decisive to break the rigidity of the dehumanised mainstream school system. But sticking to them and their time without free inquiry and innovation is in fact contrary to their spirit and aperture of mind.

[27] Cf Montessori M., 2004, chapter 12, 13 and 14.

All educational systems around the world might get inspired by them — and by other great educationists from both the West and the East but we should not get blocked at them. Decades have passed and the journey continues. They are the beginning, not the end of the path, which means that their innovation must be reinvented and exploration must go on in an open spirit, not in dogmatic terms.

Steiner himself rarely used the term 'Waldorf Method'; it was institutionalised by his followers, who recreated a closed system out of his philosophy of education that was still open to ongoing inquiry. As usual in history, the followers have made something that the founder did not do. In fact, Steiner did not pretend to be original and extensively quoted his sources of inspiration, especially the Romantics. His followers only have established the 'uniqueness' of the Waldorf Method. For Steiner it was not unique and there was no Waldorf Method even; there was philosophy of education which he explored with an open spirit.

In his own words:

"For the true teacher, pedagogy must be something living, something new at each moment. Everything that teachers carry in their souls as memories robs them of their originality."[28]

Steiner's model of human development through successive age-groups requiring specific pedagogic approaches

"(...) how important it is that teachers turn their attention in particular toward the drastic changes, or metamorphoses, that occur during a child's life — for example, the change of teeth and puberty."[29]

- **From birth to age 7 — Early childhood**
  During this period physical development is key, and children learn through play. Hence, the pedagogy must prefer play-way methods and practical activities — with both indoor and outdoor games or activities. Sensory training is also very important because learning occurs basically through the senses. Magic is equally crucial since the young child's worldview is essentially magical. Songs, poems and fairytales should be widely used together with movement games. The educational process should incorporate natural rhythm and cultural calendar, seasonal festivals drawn from different traditions and cultures.
- **From 7 to 14 — Later childhood and early adolescence**
  Proper academic instruction starts here because the elder child or young adolescent is

[28]Steiner R. 1995. "The Kingdom of Childhood. Introductory Talks on Waldorf Education", Anthroposophic Press, New York. p. 85.

[29] Steiner R. 1997. op. cit., p. 48.
Cf also Steiner R. 1996. "The Education of the Child. And Early Lectures on Education", Anthroposophic Press, New York. p. 6.

more intellectually prepared and more aware of the environment and the world. Here imagination and creativity are fundamental, and the elder child or young adolescent needs a legendary horizon that is inspirational and morally educational. Learning is essentially imaginative and artistic. The pedagogy must take special care of emotional education and artistic expression through all the arts. The elementary school curriculum is multi disciplinary arts-based, including visual arts, drama, dance (eurythmy), vocal and instrumental music and crafts. There is little reliance on official textbooks. Instead, the student creates his or her own illustrated summary of coursework in book form.

- **From 14 to 21 — Later adolescence** In this period the elder adolescent thinks more in depth and develops abstract thinking – which already awakens from 11 on. The Waldorf school must prepare elder students for college or professional life. Here, the emphasis shifts towards intellectual understanding, ethical ideals and social responsibility. In higher secondary education, Waldorf Schools provide specialist teachers for the academic subjects. Though the educational process focusses more on the academic subjects, students continue to practise the various artistic disciplines. Above all, students are encouraged to develop their own free creative thinking together with moral values and social responsibility.

Steiner's developmental approach is inseparable from a deep understanding of the human being that cannot overlook the spiritual dimension that simply exists. Waldorf education is but the translation into the pedagogic field of this deeper understanding of humanity — Anthroposophy. In Steiner's words:

"A new study of humanity, a new understanding of humanity is necessary. (...)

The second thing that we must develop as we work toward a more humane form of society, is a social attitude of the teachers towards the children already in the school. This is a new love of humanity — an awareness of the interplay of forces between the teacher and pupil."[30]

"I am not surprised that the majority of today's teachers view their work mechanically. Their understanding of humanity comes from the dead science that has arisen out of the industrial, statist and capitalist life of the past three or four centuries. That science has resulted in a dead art of education (...)"[31]

The most important to underst and Steiner's philosophy of education is to keep in mind that the Waldorf School derives from Anthroposophy understood as a 'weltanschauung', a worldview that is spiritual and

[30] Steiner R., 1995, p. 59.
[31] Steiner R., 1995, p. 60.

metaphysical, Socratic or Platonist, and also Christian, in front of the materialistic and mechanistic paradigm of the capitalist modern world.

Through this new understanding of humanity that is at the same time very old, Steiner puts forward a developmental approach to education, through which the Waldorf Method would be based upon the following principles.

- We must educate the whole child (Holistic/integral education) — physically, intellectually, emotionally, morally, socially and spiritually.
- Not only should we integrate all the dimensions of humanity in the school; also, the educational process should evolve from the whole to the parts through an interdisciplinary spirit in all subjects or activities.
- Students must be taught how to think — freely rather than what to think.
- Children must learn by themselves at their own pace — self-learning.
- Learning must occur through direct experience and practical activities/projects — experiential learning.
- Teaching must be linked to reality and the practical aspects of life. Steiner opposed the abuse of mere intellectual, abstract bookish knowledge that becomes overwhelming and finally useless in mainstream schooling.
- Teaching can be delivered in ways that are more creative and artistic, using movement, games, even dance, music or the arts; obviously this may be more suitable for the younger students in simple ways, but even in higher grades the same philosophy can be implemented on more mature terms combining different disciplines in an interdisciplinary pedagogy.
- For the lower grades, even maths can be taught in more visual and artistic ways that use geometrical forms for arithmetic — the holistic approach that integrates different aspects of knowledge and reality. For the higher grades, maths can be linked not only to science but also to philosophy and obviously to social issues — again the interdisciplinary spirit that can imbibe everything in the educational process.
- Education must be child-centred: teachers must follow children, not children following teachers — as in mainstream schooling; the teacher is a friend, philosopher and guide.
- Every student must unfold his or her own potential and vocation.
- Through education the individual must find himself; the Socratic heritage.
- Education must be transformative rather than informative. As it has been emphasised in the Indian educational tradition, love

— pedagogic love — lies at the heart of the teaching process in Steiner's vision:

"Now, my dear children, when you have felt your teacher's love all day long up here, then you can go home again and tell your parents about what you have learned, and your parents will be glad (...)"[32]

- In Waldorf schools, students and class teacher stay together and grow together through a whole seven years cycle — which might be questioned.
- There is no hurry for academics — in front of the mainstream pressure in terms of academics. Students may not begin reading until grades 2/3 and even 4 — which again may be questioned; not too early, not too late.

  Before learning to read and write, young children become familiar with shapes or forms through drawing and painting that will bring to the alphabet later.
- Steiner favoured a slower more integrated approach very different from conventional academic methods in mainstream schooling. The historical process through which humanity discovered literacy — oral tradition, images, shapes, symbols, alphabet may ease the way for children to learn to read and write. Children will first listen to a fairy tale, then they will review the story by creating images, later they will explore shapes, forms and symbols, and finally they will progressively learn the letters of the alphabet. Letters may be linked to words or ideas — B for bear — or objects or images — T like a tree. Hence, the growing child will do the experience of the human process itself.[33]
- Subjects are taught for three to four weeks.
- Children are able to learn and explore at their own pace.
- Students are not given standardised tests and marks. Their progress is measured globally through observation. Teacher's observation must be discreet not to produce anxiety in the child. Tests and grades are only introduced in the higher classes as a preparation for college.
- Teachers work with parents to set goals to students.
- In conclusion, Waldorf education wants to unfold human potential in depth with all its capacities, and educate the whole child.
- The school must stimulate both the intellectual or rational and intuitive or artistic side of the student in equal measure — unlike mainstream schooling that hypertrophies the intellect to the detriment of the more intuitive or aesthetic skills. The holistic nature of Waldorf education embraces the spiritual dimension,

[32] Steiner R., 1996, p. 31.
[33] Cf Steiner R., 1997, pp. 64–67.

dramatically lost in the modern world from Steiner's point of view. In his own words:

"We must develop and art of education that can lead us out of the social chaos into which we have fallen (...) There is no escaping this chaos unless we find a way to bring spirituality into human souls through education."[34]

Pedagogic tools of the Waldorf method

Through the successive stages of human development

"The true curriculum results from an understanding of the stages of human life."[35]

- **The first stage (birth/7) – Kindergarten/early childhood**[36]
  - Teachers must create a warm, beautiful and loving environment, which is as important as the pedagogic method itself. The physical setting must be pastel in colour to create a calming effect.
  - Furniture should be simple and made of solid wood.
  - The educational toys should also be made of wood and natural materials.
  - The classroom must be like a home.
  - Routines must be regularly set and followed (daily, weekly, seasonally and yearly routines).
  - At this stage Steiner emphasises domestic or daily real-life tasks, playing and artistic activities that children can engage in.
  - It is important to adapt the activities according to the calendar, the natural rhythm of Nature and the cultural or spiritual festivals of the year. Fairy tales, fables, poems and folklore are cherished by Steiner for this age-group; they should be told aloud by teachers — as it would be customary in the olden days. Learning must basically happen through a hands-on student-led approach.
  - For this age-group, sensory training, imitation, play-way methods and educational toys must prevail; Steiner always preferred to use natural materials and objects from Nature, which children themselves can collect.
  - Waldorf schools — like Montessori — utilise a wide range of educational games and toys, since playing is the natural way for children to learn. Waldorf schools combine movement, speaking and singing in circle group as a creative or artistic way of teaching more suitably for the nature of the young child. Free-playing is also important; we must avoid excess of adult interference characteristic of

[34] Steiner R., 1997, p. 12.
[35] Steiner R., 1995, p. 42.
[36] Cf Steiner R., 1997, lecture three.

modern societies that becomes over-protective. Sensory training is equally fundamental at this stage, developing coordination and evoking the sense of a deeper harmony.

- Movement is crucial for human growth; that is why Steiner encouraged dance — not only for girls but also boys, not only for young children but also adolescents. With professional assistance, Steiner developed 'eurythmy' — the good rhythm that incorporates all the senses, movement, gesture, music, arising the natural movement of the child, balance and a deeper harmony.
- First and foremost, the adult must awaken the sense of wonder in the young child; this will be the basis for an eagerness to learn through academics in higher grades. Teachers and parents must also foster the child's natural power of imagination, which can be refined by story-telling, poetry, the arts, etc. Hence, fantasy playing is very educational for small kids.
- Teachers must develop problem-solving in peer relationships while nurturing the sense of brotherhood, community and unity. Children must be encouraged to work in groups.
- Mixing age groups is highly educational: the younger students look up to the older and the older have a responsibility towards the younger.
- Activities in natural settings must be organised regularly while awakening the feeling of beauty and awe. The direct contact with Nature is deeply educational too. Gardening should constitute a normal routine in the school.
- **The second stage (7/14): Primary and middle school**[37]
  - Language must be based on world literature and myths; Steiner stressed both the intercultural and mythical dimensions of language and culture. Legends are as important as history.
  - Children must get to know about the world's main civilisations, religions and cultural contributions — in a horizon that is mythical, far from the materialistic world view that has alienated humanity and impoverished culture. Here we must remember — and celebrate Steiner's roots in Theosophy and Philosophical Idealism and his metaphysical 'weltanschauung' contrary to the prevailing materialism of the modern age.
  - Science teaching must cover all the areas: geography, biology, chemistry, physics, geology, astronomy, always in ways adequate to the age. In science subjects students must observe and describe scientific concepts in their own words

[37] Cf Steiner R., 1997, lecture fourth and fifth.

and drawings; experimental activities and practical tasks can be basic tools for science teaching — instead of mere bookish intellectual learning.

- Mathematics must also cover all its branches: arithmetic, algebra and geometry.
- Physical education and gardening become an integral part of education, not mere extra-curricular activities.
- Steiner especially emphasised the educational value of the arts in all the various artistic disciplines and also the different crafts.
- Following Plato, he stressed the importance of dance — not only for girls but also for boys, not only for small kids but also for teenagers; with the assistance of professional advice, he developed eurythmy.

Community life with relationship and respect for others should also be an integral part of education. Though prudent in a deeply materialistic culture, Steiner dared to introduce the metaphysical aspects of reality and knowledge, more easily acceptable through great figures, such as Plato, Dante or Goethe — for instance. This metaphysical or spiritual dimension introduced through culture can unfold intellectual or academic teaching like geometry, history or science.

- Steiner tried to work out the interdisciplinary nature of knowledge parallel to the holistic nature of reality, not only through bridges amongst the academic disciplines, science and humanities, but even by linking academics and the arts.
- For instance, a group of students will perform some dance — eurythmy that will evoke the dawn of agriculture or the first civilisations. Through this practical activity — self-experiential learning the educational process will integrate: history, culture, music, dance, performance, etc., and sometimes literature, even philosophy or science. The children can make the tools for the performance themselves, hence integrating crafts. This holistic experience constitutes the very essence of integral education. Not only must the school incorporate all the facets of education; moreover, these different facets must be integrated within the educational experience itself for self/experiential learning.
- There must be freedom in the classroom, which means freedom of thought — in front of the unilateral and therefore authoritarian discourse of the teacher in mainstream schooling.
- Learning must be basically experiential and self-directed, which means that the learning process may include teachers'

lessons but also practical activities that allow students to experience by themselves.

- Imagination and creativity, emphasised by Steiner, must always be stimulated through the educational process — in front of the mechanical routine imposed by mainstream schooling.
- Each pupil has his or her main lesson book where they write all what they learn in their own words with their own drawings. Students must find joy in learning. They must enjoy what they do and what they learn.
- Teachers must love what they teach and care deeply of their students. Steiner kept alive the old tradition of the teacher as a friend, philosopher and guide. He was closer than Montessori to the Socratic spirit.

"The teacher respected by the child as an authority should personify what is good, true and beautiful."[38] The Socratic teacher advocated by Steiner becomes a living example of the values he or she teaches, which has been strongly emphasised by integral value education in India. Amazingly enough, Steiner quotes the trinity of values — good, true and beautiful that lies at the core of the spiritual tradition of India — *'satyam'* (true), *'shivam'* (good), *'sundaram'* (beautiful). In fact the same trinity of values could be found in Ancient Greece.

As an heir of Socrates, Steiner was convinced that the true teacher must bring the student to question not in negative or nihilistic terms but in positive or constructive ways, to know himself and hence the world and others. Then belief can only come through experience. The Waldorf School cannot teach any catechism or dogma; it must accompany the growing child to question and inquire, to experience and know through his or her own experience.

For Steiner — heir of Philosophical Idealism and hence heir of Socrates and Plato through Goethe education must be essentially transformative — something that constitutes the very basis of integral education for the great educationists and sages of India that Steiner unfortunately did not know very well. As usual in Philosophical Idealism, the inner life as understood by Steiner unfolds the communitarian dimension, the *'polis'*. Education must internally transform the growing child, and this inner transformation is inseparable from social service and community concern, brotherhood and unity.

- **Through the third stage (14/21) in higher secondary school**
- Learning will be more individual, intellectual and scholarly; still it must be creative, utilising, for instance, research projects and thesis.

[38] Steiner R., 1997, p. 71.

- Free creative critical thinking should be encouraged.
- Student must find their own worldview and voice.

Summary

Waldorf kindergarten classrooms look very much like Montessori's kindergarten, since both Montessori and Waldorf are very close to each other in depth. However, Waldorf classrooms in higher grades may look more conventional quite often, with desks in front of the blackboard as in mainstream schools. This is probably inevitable to some extent, since the higher grades require an academic function from the side of the teacher that cannot be implemented in the progressive kindergarten scenario. Still, Waldorf Schools — like other schools of integral education try to implement the pedagogic principles of self or experiential learning and child-centred education even in the higher grades with classrooms that apparently look more conventional. There are ways to do it, and this is what Waldorf and other schools explore. That the Waldorf school is the expression of Anthroposophy was always clear in Steiner's views and statements, even if he was certainly aware of the materialistic bias of mainstream schooling and civilisation. "The anthroposophical movement is the basis of the Waldorf School movement."[39] It is some Waldorf educators or parents after him that have sometimes tried to establish some sort of difference between both — Anthroposophy and Waldorf school or to ignore Anthroposophy and present the Waldorf method independently from Anthroposophy, maybe to avoid problems or issues arising from social prejudice and hostility.

Another matter would be the respect for the freedom of thought of both the student and the teacher, that Steiner always respected. From this point of view, the founder made it clear that although Anthroposophy is the basis of the Waldorf School and its world view, this does not mean that Anthroposophy is inculcated to the children in some authoritarian way, because Steiner, as a true heir of Socratic, was deeply convinced of the fundamental value of freedom of thought, which means that the Waldorf School should never inculcate Anthroposophy because what Anthroposophy should teach would be precisely freedom of thought. By the way, this would be one of the three pillars of the Theosophical Society too, which was deeply Socratic just like Steiner — the most famous Theosophist with Krishnamurti and Montessori.

In Steiner's words:

"At the Waldorf School in Stuttgart we have been able to pursue an art of education based on anthroposophy for many years; and we have always made it clear to the rest of the world

[39] Steiner R., 1996, p. 162.

that anthroposophy as such was never taught here."[40]

Conclusion

The article has stried to outline the main points of the pedagogic innovation put forward by Steiner and Montessori in Europe, parallel to that of Dewey and Kilpatrick in North America or the sages of India.

Moreover, it is shown that both Steiner and Montessori share a common cultural background, which is not typically modern utilitarian and technocratic but rather humanistic, even spiritual, metaphysical and Idealistic. The foundation of their pedagogic innovation in Philosophical Idealism must be properly grasped and taken into consideration, like their association with the Theosophical Society. Otherwise, it will not be possible to adequately comprehend their educational message, or evaluate their historical significance. It is this foundation and association that makes them so deeply akin to the sages of India. And it is this kind of idealistic sensitiveness which makes all of them critical with the mainstream school system valueless, soulless and alienating and dissatisfied with ordinary schools and their inherent utilitarianism and technocracy, which reduces the multidimensional nature of humanity and reality to mere academic training from a highly rationalistic stand point.

On the other hand, some scholars or professionals of education have overemphasised their social influence or success. Certainly, a number of schools have developed all around the globe following their inspiration, and no doubt, the school system has changed to some extent in Western countries, especially for the primary section — more in North America than in Europe. Nonetheless, it must be realised that Western or modern mainstream schooling — also in Asia still faces a long process of transformation ahead; it is still technocratic and utilitarian, and it still operates a profound reductionism of the deeper multidimensional nature of humanity and the cosmos. It is still far from the holistic, multidimensional, humanistic, ethical and even spiritual vision of these great educators.

European schooling is probably more rigid and more reluctant to a holistic pedagogy than North American schools. In fact, European universities seem to be pretty rigid compared to the flexibility and dynamism of North American universities. Only Northern European countries, such as The Netherlands, Scandinavia and Finland have shown more sensitiveness towards this holistic value-based aperture. Some aperture was found in the a few social or cultural sectors of Germany. However, a major part of Europe has followed the extreme utilitarianism of the United Kingdom and the extreme rationalism of France. And the whole

[40] Steiner R., 1997, p. 30.

of Europe is deeply influenced by an intellectual worldview that has obviously promoted merely bookish knowledge instead of experiential learning. That is why Steiner and Montessori ardently defended a more experiential form of education — as it was in the Indian tradition by the way. They both still stand as a symbol of a long path of transformation ahead. Dewey and his heir, Kilpatrick opened this horizon in North America.

Outside the Western world, the scenario can even be more dramatic. Let us take the example of India, where Dr Montessori was invited to share her pedagogic innovation. She stayed in Adyar with the Theosophical Society for quite a long period of time, giving lectures and training teachers to instil her humanistic and spiritual approach to children into the Indian educational system. After half a century, it can be concluded that the Indian educational system massively ignores Montessori's contribution; not only is beating children common in most of the schools, it is more significant, there is nothing from Montessori's humanistic concern for children. Indian children are massively forced to memorise even without proper understanding in order to pour down an undigested mass of information into mechanical tests devoid of any creativity. The mainstream schooling of India constitutes the paroxysm of the typically modern utilitarian soulless education invented in eighteenth and nineteenth century Europe. Fortunately, there are new trends coming out today that strive for a more humanistic, value-based, spiritual and holistic kind of education.

Even in the cradle of modernity, Europe, more and more parents dislike the mainstream school system and feel that it lacks the humanistic touch of Montessori, the spiritual and holistic sensitiveness of Steiner, or the progressive and deeply ethical vision of Dewey or Kilpatrick. An increasing number of parents search for alternative schools and do not find enough of them — especially in Southern Europe.

Therefore, it can be concluded that, in spite of some evolution through the twentieth century, mainstream schooling is still essentially technocratic, utilitarian and valueless; it still reduces the deeper multidimensional nature of the human being to poorer merely academic patterns, because the world view or paradigm in general terms has not changed yet. Education is always a mirror of the whole civilisation. If you go to another country or continent, or another solar system or galaxy, and you want to know about their civilisation and world view, first and foremost examine their educational system, and you will get to know everything about them, their culture and their state of consciousness.

Then, the educational message of great educationists, such as Steiner or Montessori in Europe, Dewey or Kilpatrick in North America, together with the sages of India, can still be a

source of inspiration for a long process of transformation of the educational systems towards a more holistic, ethical, spiritual and humanistic vision, knowing with Kant that ethics and humanism cannot be separated, and also knowing with R. Panikkar that humanism and spirituality cannot be dissociated either.

R. Panikkar warned that technocracy and humanism are mutually exclusive, and in terms of civilisation we must make a decision for one or the other. The modern world has made a clear decision — for technocracy, and nothing has changed yet in general terms; in fact it has even worsened, just see the abuse of technology in daily life and amongst children in particular, or just see the increasing consumerism everywhere, also in Asia. The school or college system is a reflection of this technocratic world view. R. Panikkar defended another choice — for humanism; like Steiner and Montessori, like the sages of India.[41]

In spite of the normal caution in this kind of mainstream report, the researchers of the University of West England conclude:

"There are a number of aspects of Steiner's school practice that might readily inform good practice in maintained schools, whilst others may be more controversial but could be the basis for profitable dialogue."[42]

The controversial aspects could only arise from the difference of paradigm or world view between Steiner and mainstream schooling as indicated in the introduction of this article. The controversy, if arising, may be properly channelled, knowing that within the paradigm of Philosophical Idealism wisdom is an invitation; unlike the common ego and ordinary ideologies, wisdom never imposes itself. As the renowned philosopher R. Panikkar stated, you can take it or not, this is your freedom. It is an invitation; it only suggests.

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[41] Cf Panikkar. 1999. *Cultural Disarmament. The Way to Peace.* John Knox Press, Louisville (Kentucky)
——. "The Dialogical Dialogue", in F. Whaling, coord., "The World's Religious Traditions", T. and T. Clark, Edinburgh, 1984.

[42] Ph. Woods, M. Ashley, G. Woods. 2005, p. 8.

Analysing the Philosophical Ideas of Nel Noddings on Empathy and Care

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Abstract

The relationship between the teachers and students for a longtime was always looked up to as one that is built and nurtured on elements of trust, love and care. But this unfortunately has gone amiss. This relationship has now succumbed to the onslaught of market-driven economy where education is a 'good' to be bought and teacher a mere vehicle to deliver these goods keeping the paying capacity of the client in mind. Therefore, 'care' as a lived value is not a priority. The usual malaise which plagues the system is the focus on examinations and marks and not on the learning outcomes. When learning outcomes are the least of your concerns then the collateral damage is the absence of empathy and care in students. This paper is an attempt to provide insights into the strategies and activities which may be used with students in order to inculcate these values looking at the rich repertoire of ideas put forth by Nel Noddings who happens to be an authority on the subject.

Introduction

This paper is an attempt to present a model for educationists both at the school and higher education level in order to infuse the indispensable elements of empathy, care and reflection in educational discourses. The analysis is based on the philosophical ideas of the American Philosopher Nel Noddings who has written extensively on the importance of empathy, care and critical thinking for educating students. Nel Noddings (2012) enlightens us that, though the word empathy is relatively new to the vocabulary, added just in the early

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part of the twentieth century, it is still important for us to understand that it is not the same as sympathy. Empathy according to Nel is the ability to feel the other person's pain and misery without being a part of the journey which inflicted the pain. She further adds that being empathetic includes doing every bit to bring the individual out of that painful experience. However, it is important to understand that the act of being empathetic or to empathise is also a process. This process begins with actively listening and according full attention to the narration of the painful incident or experience by the individual who has gone through it. Noddings (2010) further cautions that for empathy to be nurtured by teachers in their students it is critical that they bond with each other or feel attached with each other in order to succeed in the induction of the feeling to understand the other person's pain. However, if the relationship between the teacher and taught is not cordial then in all probability it shall nearly be impossible to evoke this feeling in students by the teacher. In the perspective of 'care', Noddings (2012) adds that teachers in an institution ought to nurture students with utmost care in the first place. This caring should be undertaken by beginning with listening to the student voices with patience and without being judgemental about them. Teachers need to understand the needs and interests of students by giving them umpteen opportunities to share their concerns, anxieties, fears, joys, struggles, trials and jubilations. This is best done by creating an environment which is fearless, non-threatening and is based on the foundations of love and trust. A caring teacher also makes sure that they empower the student with the necessary knowledge and skills needed by them to traverse the journey of life. This teacher is not merely obsessed with the mechanical achievement of the goals laid down by the curriculum but with the larger picture that is the overall well-being of their students. Caring teachers make sure that they are competent enough to transact the curriculum effectively by building the knowledge pools of their students. They constantly strive to upgrade their own knowledge and skills in order to give their best to their students. This includes teaching the core subject by drawing on the interconnections with all the related subject areas and presenting a holistic picture. Such enriched teaching learning environment not only prods the students to the peak but also pushes the teacher towards the acquisition of new knowledge thus making the exercise essentially mutually rewarding. Looking at empathy, care and critical thinking from the rich philosophical lens provided by Nel Noddings has enabled the author to build a model to nurture the same in educational institutions. It is important to begin with clarifying the concept of empathy and care as given by Noddings.

Understanding the Meaning of Empathy and Care

It appears to be a simple process when you think of inculcation of 'empathy' and 'care' but in reality it is rather complex. Many theorists have defined empathy, but keeping in mind the connotation given by Noddings (2010), the one given by Stueber is the most apt. According to Karsten Stueber, "Empathy as understood within the original philosophical context is best seen as a form of inner or mental initiation for the purpose of gaining knowledge of other minds (Stueber 2006)." When a teacher teaches students to empathise or in other words to feel the responsibility to alleviate the pain of those around them it is important that there is an attachment between the teacher and students after all empathy is one of the crucial aspects of emotional literacy. If the teacher and the taught are sharing a strong bond to each other or are attached to each other then they will be able to cultivate empathy in the students. However, if empathy is taught as a technique in a mechanical manner and the teacher is either disliked or has no attachment with his or her pupils then in all probability there shall be no empathising in the given situation. In other words, the concept of empathy as given by care theorists makes attachment to be a prerequisite for its cultivation. Secondly, the students need to be motivated to recognise the needs of others around them. It means they need to be sensitive and attentive to the feelings of hurt or pain of others irrespective of the fact whether they were or were not a part of inflicting the same. In most of the situations when we listen to the hurtful or painful experiences of others we are able to be aware of what the person is going through and thus we feel for them. This experience, thus, enables us to defer our own engagements for a short period of time in order to direct our energy towards the fulfillment of the needs expressed by the person in need. Nel Noddings (2010) has identified this as 'motivational displacement' which finally helps us to respond. It has also been seen that with our immediate circle of family and friends we are empathetic involuntarily, however, with others it necessitates moral effort. Let us now look at the concept of 'care'. The concept of care is discussed here as a part of the ethical caring which is relational as in the case of the teacher and the taught. Caring in institutions is important as it has a direct bearing on learning. According to Noddings (2005) there are four basic components of moral education which are the foundation to the establishment of caring relations. The first which holds prime importance is 'Modeling' in other words teachers need to be role models of care for their students to look up to. If teachers exhibit a caring behaviour and attitude there is a high possibility that students would emulate them. The second aspect which is indispensable

to develop caring as a value in students is 'dialogue'. Teachers need to engage in meaningful dialogues with our students not only on subject knowledge but on their concerns, fears, anxieties, longings, experiences, etc., such that they are able to understand them better. When teachers and students share their feelings with each other according full attention in the process to understand each other they develop an interpersonal bond which enables them to relate to each other better. For any dialogue to be productive it is important that it takes place in an environment where both parties listen to each other patiently. Further Noddings (2005) points out that when we engage in caring, dialogue helps us to get a feedback on our efforts to care. It is also important for teachers to engage in dialogue for discussing the different dimensions of care with their students.

The third important element in care is practice. It is well known that one learns what one practises repeatedly, therefore, as teachers it is important that to give ample opportunities to students to be involved in caring. Once caring becomes a part of their mental scheme it shall come to them automatically. It is also to be noted that when the students engage in practise it is important that they are under the supervision of their teachers or mentors to ensure that the interactions are rightfully caring. This practice according to Noddings (2005) should also involve a critical reflection on their acts of caring in order to equip them with a better understanding in their future encounters with those they cared for.

The final critical element in care theory is confirmation. This means an approval which comes about, about the act of caring. For example, the students volunteered to work in earthquake hit neighbourhood states and worked hard in the restoration practices on ground and when the teacher acknowledges the painstaking efforts of the students with respect to the support they rendered to the earthquake survivors then this leads to confirmation of the motive of care. But there is a word caution here by Noddings (2005) that this confirmation shall hold value or remain valid only if the teachers and students share a loving and cordial relationship with each other. Thus, when a teacher engages in confirmation they should acknowledge the goodness in the students and applaud them for the same. This act of confirmation is neither mechanical nor formulaic. It is a recognition of something worthwhile a student has undertaken according to their capacities. Therefore, as a teacher one must remember that this yardstick cannot be used to give confirmation in all situations of care giving.

Strategies to Inculcate Empathy and Care in Students

Nel Noddings (2006) and a number of other educators have been

advocating, since long, a complete reorganisation of the curriculum especially in schools such that issues which surround human existence gain prominence. But this concern has not been taken seriously by the curriculum planners and policy framers. The only emphasis we find is on academic achievement in terms of grades or marks and on competition instead of cooperation. Now, in this prevailing environment in educational institutions the educators have this phenomenal responsibility of cultivating an empathetic and caring heart. To begin with, the first strategy to this is to develop caring relations with pupils which begins with *'Listening'.*

a. Listening to student voices

When teachers listen attentively and patiently to the students, in the process they gain their students' confidence. In such an environment it is more probable that students will acknowledge and accept what they are being taught. Since it is a caring relationship any pedagogical intervention will be welcomed readily and will not be seen as a hindrance. Also when the teacher listens to his or her students the students will feel motivated to engage in a dialogue with them and this shall empower teachers with crucial information about them, such as their interests, needs, hobbies, talents, fears, problems, etc. According to Noddings (2012) this in turn shall prove worthwhile to teachers to organise their lessons in order to cater to the individual needs of their pupils and also increase their own proficiency for catering to their needs. For teaching different subjects teachers need to bring in diverse connections with varied disciplines including existential questions in the discourse. In the course of such conversations students get that spark of learning which was somewhere amiss. For example, as a Biology teacher apart from teaching the content in the syllabus one needs to touch on the meaning of life, care, existence, holistic growth when dealing with reproduction, evolution, etc. When a teacher does so, the students are able to make connections between the subjects taught and the larger canvas of life. Therefore, teaching no longer remains routine it becomes more interesting, invigorating and challenging both intellectually and emotionally. Secondly, it is also important for teachers to listen to the conversations in which students engage with their peers and observe them while they are working in groups as this gives a clear perspective on the way they are developing.

b. Discussions enabling self understanding

It is a well-established fact that teachers cannot achieve success with students through sermonising and ordering them about dos and don'ts. It is important to raise key issues which are related to the lives of our learners. For example, a group of

students were found to be repeatedly laughing on one another in the class whenever any student raised a question or offered a comment on the theme being discussed. The teacher then decided to stop the discussion and very politely asked one them in the group that was laughing to tell all how it would feel if the class started laughing on them. The students immediately responded that they would feel bad and the task was done. The behaviour was not repeated and the entire class got the message. On another occasion while discussing the evil of dowry in a class on gender studies a student shared her experience. She felt humiliated when the entire family of the groom came to her place and not only asked her to walk in front of all of them to check for any disability, to which she obliged under pressure from her family, but to her shock then took out a measuring tape to measure her height, to which she put her foot down and walked out. She was applauded by the entire class for her brave decision. And then what followed was a number of other students narrating their similar experiences and discussing the need to say a loud 'no' when one should. Many a times these discussions in the class may also begin by the teacher taking the lead to discuss their own oversights and predicaments. When teachers acknowledge uncertainties in turn they support learners in the arduous task of learning how to live with inevitable uncertainties. In this voyage of self discovery through dialogue, the narration of stories selected carefully may also be included, depending on the age group being catered to. Here most of the theorists have cautioned that stories if used directly to teach virtues may not be successful. However, if the narration of stories takes place in the concerned subject instead of a moral science class or a value education session it shall have the needed effect as we all know for sure that moral science lessons are seldom taken seriously. Most importantly the stories narrated or enacted should be followed by an engagement in dialogue on the lines of asking students to share their experiences related to the story. One word of caution is the key here that if students engage in ethical behaviour, educators may praise them or pat their back but presenting awards to them on public platforms like the school assemblies or other functions can be really problematic. The reason being, that this encourages competition to do good only if there are rewards. What educators must aim at is to create a culture of care giving through repeated dialogue on moral concerns under guided practice such that students are intrinsically motivated to care for all the beings around them. This takes place when they understand the meaning of self and their existence as a part of this universe.

c. Selecting and Managing Ideas on Care in the Classroom Discourse

There is no doubt that in order to teach empathy and care the best strategy is to indulge in the practice of the same by nurturing relationships with students based on unconditional love and trust. According to Noddings (2007) caring is not just a nebulous feeling but requires constant effort to work in the best interest of our students. In institutions as teachers or teacher educators one needs to begin with paying attention to cooperating with students in the activities in which they engage and share their own hopes, expectations, dreams, desires, fears and reservations with them. Secondly, the themes of care need to be carefully infused in the classroom discourse, for example, while discussing history, the harmful effects of war may be discussed, in Geography caring for the people displaced due to floods, earthquakes, fires, etc., can be discussed, in a Social Science class caring for the elderly, for strangers, etc., may be included, to teach harmony and brotherhood and in language classes the themes, such as empathy, love, friendship and care through poems, plays and stories may be brought in. In philosophy, the teachers may engage students in meaningful discussions on care ethics, philosophies of existentialism and humanism and give examples drawn from the biographies of philosophers. In psychology, the discussions on care for the differently-abled, adjustment with peers and surroundings, model behaviours, parenting, coping with a bereavement in family, life skills to say no to smoking, drinking and drugs when you encounter peer pressure, coping with the trauma of bullying, etc., may be included. In sociology, the issues surrounding poverty, social stratification, discrimination, racism, sexism and citizenship may be discussed. In mathematics, inequitable distribution of wealth between nations, statistics depicting the crime rate in our country, correlation between crime rates and the penalties imposed. This is a controversial statement. In economics, care related to environmental economics with respect to the impact of globalisation, etc., can be discussed. In biology, the different stages of development and the care aspects associated with them and also issues related to creating environmentally friendly habits, behaviours and attitudes for a green planet, may be discussed. In physics and chemistry, the benefits of technology and their associated threats, may be discussed. And yes in medicine all aspects of care and ethics related to nursing and care giving by doctors, nurses and other care givers which leads to holistic healing can be discussed. Noddings (2007) also elaborates that these themes of care may be discussed either by engagement of students

by way of interdisciplinary teams clubbing students stage-wise and conducting workshops or symposia on the same involving the students or the themes may be selected individually and discussed during an individual teacher's class during the semester. Another way of discussing varied issues surrounding care is to engage in brainstorming on themes spontaneously whenever the topic in question warrants. In others words, it shall be deemed irresponsible of us teachers ethically and morally if we fail to include discussions on care while transacting the course curriculum. Noddings (2007) also cautions us that during the course of the discussion it is important that in an emotionally charged environment when students start sharing their personal experiences in front of their teachers and peers they need to safeguard them by letting them know the pros and cons of sharing information privy to them. We also need to be very sure that questions which ensue during the course of these conversations do not make the individual who is sharing his or her thoughts or experiences uncomfortable or in other words the questions are not intrusive in nature. Discussions, debates, role plays, workshops, seminars, symposia may be held around the themes of care to make this journey enjoyable both for the teacher and the taught.

d. Creating institutional support mechanisms to teach 'care' effectively

Administrators, curriculum developers and policy framers need to understand that care is a grave concern and it ought to be taught as a basic human value. Noddings (2007) examines the preparations which institutions and educators require to delve on the teaching of care effectively. Firstly, educators need to be fundamentally clear that one of the key objectives of responsible and responsive education is to cultivate the capability to care and for this the educators need to be caring themselves in the first place. For an atmosphere of care to flourish we need to have educators engaging meaningfully with their students on a regular basis in small groups, i.e., the teacher student ratio ideally for this kind of involvement should not be more than 1:20. Another important aspect which needs to be kept in mind is that teachers and students need to have a longer association, i.e., the class teachers especially in schools should remain the same for a couple of years. This shall enable the development of caring relations between them along with a sense of belonging for the school. This shall also help develop a bond of love and trust between the teachers and students over a period of time thus creating an enabling environment for teaching of themes of care. It is natural for human beings to be sensitive to each other's needs once

they feel attached to each other. The primary and elementary schools still have the curriculum enriched with themes of care for the teacher to weave her discussion on. However, it is seen that at secondary and senior secondary stage where students are grappling with adolescence and issues surrounding it there is hardly any platform or content in the texts or readings which focusses on care. On the other hand, teachers are under tremendous pressure to generate high test scores and thus their main mission of teaching care to their pupils takes a backseat. Institutions need to rework their vision and mission with respect to what they need to develop in the first place. A teacher, after parents, at home should be regarded as the primary care-giver and to facilitate the teacher in this role it is important to understand that we cannot afford to burden our teachers with menial jobs which require them to be stuck either with scoring a huge number of answer scripts or be glued to their laptops or desktops preparing results. And above all the most critical change which the system warrants is a change in the attitude of administrators and policymakers towards understanding that teachers are the most important change agents in the lives of students and we need to give them ample time and opportunities to nurture the spirit of care in their pupils instead of overburdening them with routine mechanical chores.

e. Use of method acting to cultivate empathy

Susan Verducci (2000) on extending the work of Nel Noddings on 'Care Ethics' has tried to explore the use of method acting in inculcating empathy. When you understand life, the times, the influences, the cultural setting, the historical setting, etc., by reading about the character you are to play, this exercise enables you to empathise with the character too. The element of dramatic empathy does influence you as an individual when you play the character. However, it is required to understand that whether it is drama or movies both are a powerful media to reach out for an emotional response from the target audience. Plays and movies carefully selected for discussions do provide a fertile ground for engagement in critical thinking and reflective practice on issues surrounding empathy and care. Drama, thus, enables students to make connections with their own lives and the lives of others around them thus making it possible for educators to infuse themes of empathy and care very subtly through the hidden curriculum. Verducci (2000) emphasises the uses of the techniques of dramatisation in order to sensitise the students to the issues of empathy and care. But in no way does she establish a cause and effect relationship between drama and empathy, leaving it for educators to research further.

Conclusion

Therefore, it is high time that teachers and teacher educators realise that if we do not make efforts to inculcate empathy and care in our students then we are failing in our duty towards humanity at large. It is dangerous to cater to the development of a critical thinking mind without nurturing an empathetic and caring heart. We ought to explore the use of the strategies outlined by Nel Noddings and analysed in this paper in order to bring back the lost love, care and trust in relations in institutions. To begin with let us love our students unconditionally and non-judgmentally and listen to their concerns with complete attention so that the journey with respect to inculcating care as a value is fruitful and fulfilling both at the same time.

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Teacher's Perception Regarding Inculcation of Values through Mathematics

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Abstract

Values in human life are one of the important components in daily action. In our education, it is a debated subject because of the chaotic conditions one can observe in almost all spheres of life. This chaos is mainly due to lack of values in the education being imparted. It is the need of the hour to inculcate values in schools through different subjects and also through various methods. Mathematics is a core subject of study for the students in school curriculum. Mathematics learning results in the development of a number of fruitful values for the students. However, these values cannot be attained automatically by learning mathematics. Only a resourceful teacher of mathematics, with his or her efforts and planning makes it possible for the students to attain these values. A teacher can inspire students by what he or she is and not by what he or she knows. The purpose of this paper is to study about the teacher's perception regarding values and its need for the students as well as to find out the strategies and the topics used by teachers for inculcating values through mathematics. The study is qualitative in nature. As for the techniques used for data collection, questionnaires for the teachers and observation methods were used. Data collected were submitted for content analysis which was done on the basis of categorising the responses given by teachers that emerged from the research questions and objectives.

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Introduction

'Education without values, as useful as it is, seems rather to make a man clever devil.'

—C.S. Lewis

Education has a vital role as it is a primary need for everyone. Education enables us to learn a lot of things and provides a variety of opportunities. Providing moral values to students enables them to find the right path. Education without values makes a person devil. If a person cannot differentiate between good or bad, right or wrong, significant or insignificant, there is no use of such education. Values are roots of human character and thus determine human behaviour. A person with values can create a good society by spreading peace and happiness. Mahatma Gandhi also emphasises on values and said that, "Formation of character should have priority over the alphabet." Many other philosophers like Rabindaranath Tagore, Swami Vivekananda also talked about inculcating values in children. Therefore, it is necessary to know about the meaning of values.

What are Values?

The term value has been derived from a Latin word '*velere*' which means 'to be of worth'. Value is a dynamic term used in different aspects. But mainly it stresses the significance of values at personal, community, national and global level. It may be described as an emotional attitude (affective) which motivates a person directly or indirectly to act in the most desirable way.

According to Zaleznik and David (1964), "Value as the ideas in the mind of men comparable to norms in that they specify how people should behave. Value also attaches degrees of goodness to activities and relationship."

Need for Values

Values remain a part of discussion in many policy documents in India. These policies and commissions emphasise the need of value education in the school curriculum. In *Report of Education Commission* (1964–66), it is said that, "The weakening of social and moral values in younger generation is creating many serious social and ethical conflicts in western societies. It is not our purpose to enumerate a list of values to be inculcated. What we would like to emphasise is the need to pay attention to the inculcation of right values in the students, at all stages of education.

According to NPE 1986, "In our culturally plural society, education should foster universal and eternal values, oriented towards the unity and integration of our people. Such value education should help eliminate religious fanaticism, violence, superstition and fatalism.

According to National Focus Group on Aims of Education (2006), "Value education must be a part of the education system, values or virtues must be integral to the whole process of education. Value

education cannot be imparted as a separate bit of education; the whole education has to be value education. For this we need powerful reminders, in a variety of ways, of the Gandhian ideas of *ahimsa*, peace and harmony. The policies and commissions also emphasise the need of value education in order to make education a powerful tool for better living standards. Increasing indulgence of juveniles (teenagers) in crime is the proof of degradation of values in our society. For maintaining a peaceful environment in the society, it is necessary to provide value education to the students. Teaching values cannot be separated from the education system. We need to follow the ideals of legend Gandhi, i.e., *ahimsa* (non-violence) and peace. Values cannot be isolated as a different subject, but should be integrated with the curriculum. Values can be inculcated in the classroom through different subjects.

Mathematics is an abstract subject based on logical reasoning and analytical thinking. Mathematics is a part of our everyday life. It is all around us. It is the building block for everything we do. But students do not usually relate mathematics to their real life and thus it is difficult to think about inculcating values through mathematics. Many researchers have also worked on inculcation of values through mathematics and some have worked on mathematical values. Margret Taplin (2016) in his article "Teaching Values through a Problem-Solving Approach to Mathematics" has suggested some reasons why problem solving is an important vehicle for educating students for life by promoting interest, developing common sense and the power to discriminate. The researcher showed the problem solving approach as a vehicle which encourages flexibility, helps students in constructing their own ideas about mathematics and promote value education among pupils. Othman J. et al. (2012) also worked on "Unveiling the Values Inculcation Model among Mathematics Teachers in Developing Country: A Conceptual Approach." The study is based on mathematical values inculcation model, i.e., ideological mathematical value, attitudinal mathematical values, sociological mathematical values, motivational mathematical values and the findings of the study suggested that there is a significant covariance relationship between the constructs of values inculcation in mathematics teaching and learning.

The values cannot be attained automatically by learning mathematics. Only a resourceful teacher of mathematics, with his or her efforts and planning makes it possible for the students to attain these values. The purpose of this paper is to study about teacher's perception regarding values and its need for the students as well as to find out the strategies and the topics used by teachers for inculcating values through mathematics.

Research Questions

1. What is the teacher's perception towards inculcation of values through mathematics?
2. What are the strategies and topics in mathematics through which teachers inculcate values?

Delimitation

The study was confined to only 15 teachers of Kendriya Vidyalaya Sangathan (KVS) in Delhi.

METHODOLOGY

The study was qualitative in nature and included 15 Trained Graduate Teachers (TGT) of mathematics from five different schools of KVS in Delhi. Purposive sampling was used for collecting the data. Regarding the technique of data collection, questionnaire was used. Ten questions were framed as per the need of the objectives and research questions. The questions were mainly emphasised on teacher's understanding and awareness about the concept of values, its need for students and also on the techniques of inculcating values through mathematics. The questions were framed keeping in mind the objectives of NCF 2005, aims of education and the building blocks of values described by CBSE. Data collected were submitted to content analysis on the basis of categorising the responses given by teachers that emerged from the research questions.

ANALYSIS

The findings of the studies are as given below.

Perception of teachers regarding 'Values'

This question explained about the different views of teachers about values. On the basis of their responses five categories were framed. It mainly emphasised on the teacher's understanding about the term 'value' (Table 1).

Table 1

Category 1	Category 2	Category 3	Category 4	Category 5
Deep effective qualities, crucial component of effective environment	Behaviour according to social norms	Something that denotes the degree of importance of something	Something that describes the significance of axiology	That has worth for human kind
26.67%	20%	20%	13.33%	20%

In the dimension of perception of teachers regarding what are values, 26.67% of teachers explained that values are deep effective qualities and a crucial component of effective classroom environment. Equal percentage of teachers (20%) responded that values are something due to which people behave according to social norms and it reflects the degree

of importance of something which also has worth for human kind. According to 13.33% teachers values are something that describes the significance of axiology.

Need of value education at the upper primary level according to teachers

This question elaborated the teacher's views about the need of value education at upper primary level (Table 2).

Table 2

Category 1	Category 2	Category 3	Category 4	Category 5	Category 6
Provide opportunities to acquire knowledge, skills and attitude for self development	Energy can be streamlined easily at this stage	Values taught at this stage are relatively permanent	Will learn adjustment and cooperation	For the betterment of individual and nation	To develop activeness, adaptability, ambition, anticipation and accuracy
13.33%	6.67%	13.33%	20%	33.34%	13.33%

In regards to need for value education at upper primary level, equal number of teachers (13.33%) responded that values provided opportunities to acquire knowledge, skills and attitude for self development and also developed activeness, anticipation and accuracy, and were relatively permanent. According to 33.34% teachers, value education was for the betterment of individual and nation. Around 20% teachers responded that it was essential for adjustment and cooperation.

Perception of teachers on inculcation of values through mathematics

This question was about the teachers' views regarding inculcation of values through mathematics. Were teachers able to identify and inculcate values in correspondence to mathematics subject? (Table 3)

Table 3

Category 1	Category 2	Category 3	Category 4	Category 5
Time management, discipline and balancing situations through addition and subtraction	Hardwork, honesty, truth through problem solving	By group project, activities and value-based questioning	Truth and honesty by applying math in real life	By numbers and functions
26.67%	26.67%	20%	13.33%	13.33%

All the teachers were agreed for the statement that values can be inculcated through mathematics. Different teachers shared different views for the inculcation of values. Equal number of teachers (26.67%) responded that through addition and subtraction and through problem solving methods different values like time management, discipline, honesty, hard work, truth, etc., can be inculcated in students. According to 20% of the teachers, with the help of group projects, activities and value-based questioning, values can be imparted. Another equal number of teachers (13.33%) said that by applying mathematics in real life, the values of truth and honesty can be developed in students (Table 4).

Table 4

Topic of mathematics which can be best used for inculcation of values through mathematics

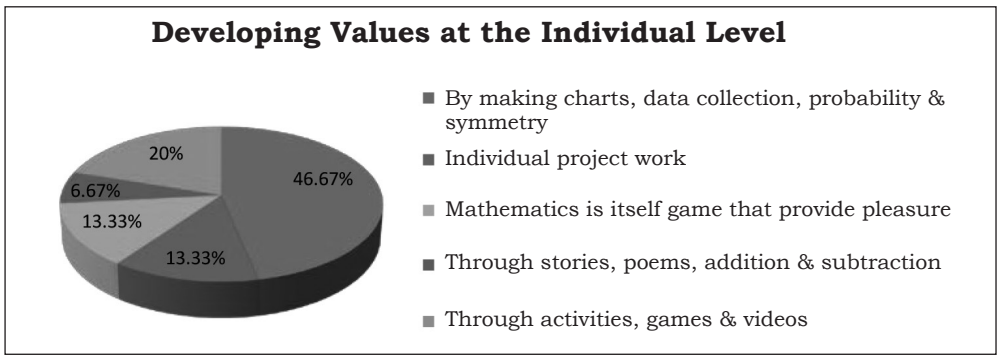
Category 1	Category 2	Category 3	Category 4	Category 5
Trigonometry, mensuration, geometry, and problem solving method	Each and every topic — that may useful for mental, spiritual or physical level	Mensuration, comparing quantities, and geometry	Arithmetic and percentage	Addition and subtraction
20%	26.67%	20%	13.33%	20%

The table shows that 26.67% of the teachers responded that each and every topic can be used for inculcating values through mathematics. Equal number of teachers (20%) said that trigonometry, mensuration, geometry, comparing quantities, arithmetic, and addition and subtraction can be used for the inculcation of values indirectly.

Strategies and topics through which building blocks of values (developed by C.B.S.E) can be developed through mathematics

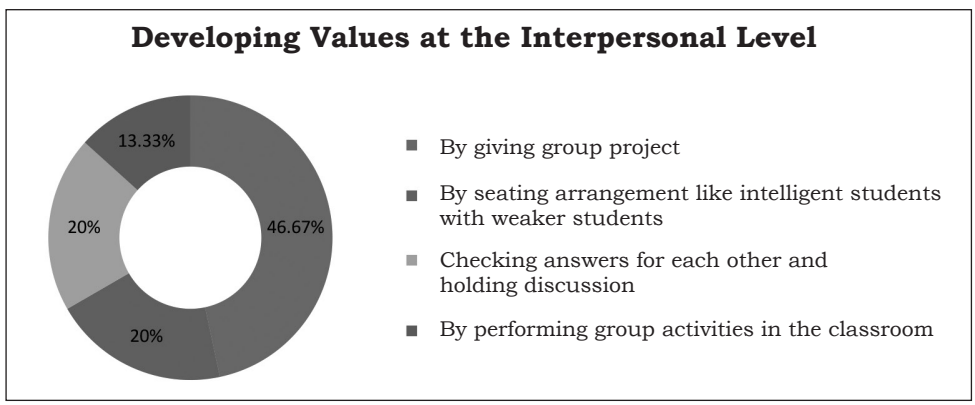
I. At Individual Level – trust, truth, joy, creativity

By making charts, data collection, probability and symmetry	Individual project work	Mathematics is itself a game that provides pleasure	Through stories, poems, addition and subtraction	Through activities, games and videos
46.67%	13.33%	13.33%	6.67%	20%



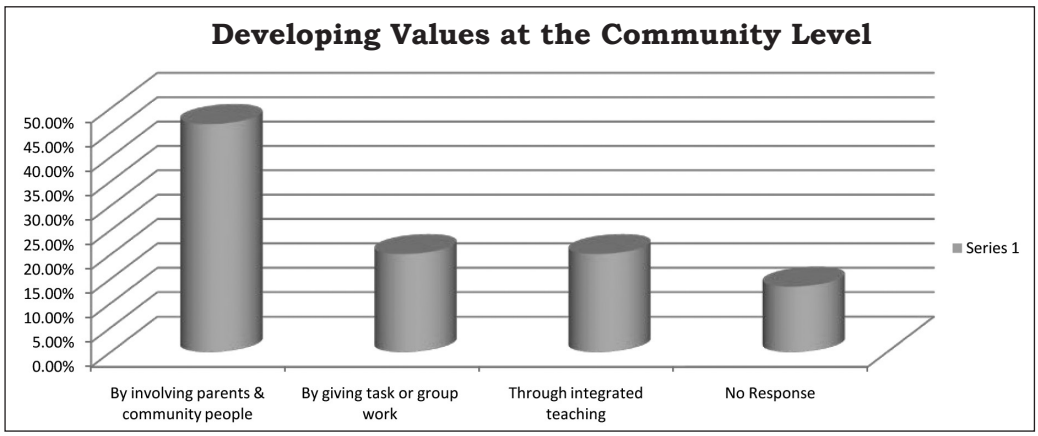
II. At the Interpersonal Level – empathy, cooperation, acceptance of differences

By giving group project	By seating arrangement like intelligent students are made to sit with weaker students	Checking answers for each other and holding discussion on them	By performing group activities in the classroom
46.67%	20%	20%	13.33%



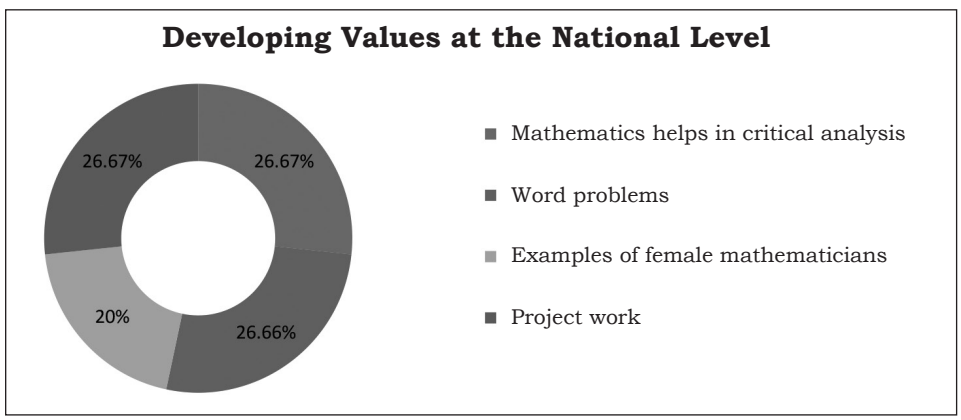
III. At the Community Level – tolerance, mutual respect, healthy family relation

By involving parents and community people	By giving task or group work and explanation of work by each member	Through integrated teaching	No response
46.67%	20%	20%	13.33%



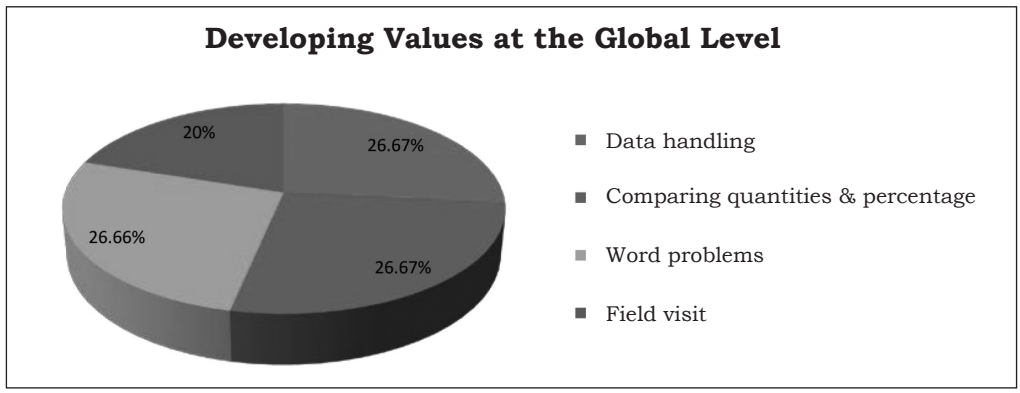
IV. At the National Level – freedom from biasness and stereotypes, national integration, equality

Mathematics helps in critical analysis	Word problems	Example of female mathematicians	Project work
26.67%	26.66%	20%	26.67%



V. At the Global Level – environmental concern, appreciation of world's heritage

Data handling, e.g., states of pollutants	Comparing quantities and percentage	Word problems	Plantation of trees or field visit
26.67%	26.67%	26.66%	20%



Examples of inculcation of values through mathematics from classroom

- While solving problems in group, students become disciplined and more hardworking by peer learning
- Students develop experience of full range of emotions associated in various stages of solution process
- Preciseness and accuracy in drawing geometrical shapes
- Correctness of a step taken in solving a problem
- Giving project work related to data handling
- Inculcating the values of sharing with the help of fraction and decimals
- During lesson plan of division the teacher can explain about the importance of accuracy
- During activities the method of teaching teachers can be explained by using deductive and inductive methods.

Discussion

The need for value education should be emphasised for the holistic development of students and it is necessary that teachers keep these needs in consideration while teaching their subject.

The findings of the study revealed that teachers were aware with the needs of inculcation of values and they also enlightened values in students indirectly with the help of different methods used in doing mathematics like through group projects, activities and problem solving method. Researchers found that teachers used different strategies like data collection, project work, stories, poems, by involving parents and community people and topics like data handling, comparing quantities, word problems, addition, subtraction, division, fraction, etc., for inculcating values including trust, truth, empathy, cooperation, tolerance, mutual respect, freedom from biasness and environmental concern.

Conclusion

The results of the study concluded that teachers have different perspectives regarding values and its inculcation through mathematics. It is clear that teachers use various strategies and with the help of different topics impart values in students especially problem solving strategies, word problems and group project were emphasised by the teachers. It is also concluded that teachers preferred almost same strategies and topics which indicated that there is a need to do lots of work through which teachers can spell out values for each and every topic of mathematics. Some workshops or in-service training can be provided for the teachers.

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Cartoon: A Constructive Pedagogical Instrument

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Abstract

Our pre-historic ancestors have pictures of hunting activities on the walls and ceilings of the caves they inhabited. When modern humans find these pictures, they have a fairly good idea of what they depict because they represent an object or event directly and not symbolically. Today our National Curriculum Framework 2005 advices teachers to connect the curriculum to the child's lives' experience. Cartoons can make that connection with ease. This study tries to show how cartoon in a constructive pedagogical view helps in engagement, construction and dissemination of knowledge among students in curriculum transaction.

Introduction

"I hear and I forget. I see and I remember. I do and I understand."

Confucius

These words of Confucius clearly states what constructivism means. The National Curriculum Framework (NCF) 2005 of NCERT has proposed a shift in the approach of teaching and learning from the earlier behaviourist approach to constructivist approach. Constructivism is basically a theory based on observation and scientific study about how pupils construct their own understanding through experiencing things and reflecting on those experience (Namdeo 2012). In the context of constructivist pedagogy, teacher plays the role of a facilitator while the student plays

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an active role in the learning process in everyday situation (NCF 2005).

Using activities by cartoon can be related to social learning theory and constructivism. Vygotsky's social learning theory (Kozulin 2003) says that mediating agents help the learner make sense of the environment, and facilitate learning. An appropriate learning and teaching environment should be created in order to make students actively involved in the learning process, help them question and assimilate the new information and construct their own knowledge. Thus, it is important that proper learning material is prepared and used for meaningful learning to occur and for students to be actively involved in the learning process. One of these learning materials is cartoons. According to Arunraj et al., (2014), a carton is a visual medium and a two-dimensional illustrated visual art with humour that can be in either the form of a single picture or a series of pictures, captioned or non-captioned, that appears in magazines, newspapers or books. There are seven types of cartoon which can be utilised in constructivist classroom. They are political cartoon, illustrated cartoon, gag, comic book or serial cartoon, commercial cartoon, concept cartoon, feature length animated cartoons Dhangsubhuti (2006).

Constructivism and Its Guiding Principles

The latest catchword in educational circle is 'constructivism', applied both to learning theory and to epistemology — both how people learn, and to the nature of knowledge. The term refers to the idea that individuals, through their interaction with the environment, construct their own knowledge and meaning (Fosnot 1996; Steffe and Gale 1995). Fosnot (1989), Audrey Gray Jonassen (1994), Katar Singh (2012), and NCF (2005) state various principles of a constructivist classroom, such as construction, collaboration, reflection, integration, negotiation, and activation. From the perspective of constructivist view, learning is supported by multiple experiences and social interactions, rather than by solitary rote memorisation (Dewey 1916, 1956; Piaget 1973, 1980; Vygotsky 1978), cartoon can give those experiences as it is aesthetically appealing, humourous, attention-attracting or motivating by fulfilling the cognitive role (Khulhavy et al. 1986). As Micheal and Wyk (2011) states, cartoons will support teaching in constructive learning, contextual learning, social skills, collaborative learning, critical thinking and small group learning.

Cartoon a Tool of Construction

Construction of knowledge is an active process involving mental action of the learner. Construction needs active engagement of learning in social setting. It involves enquiry, questioning, application and reflection leading to the theory building and the creation of ideas

(Bharati et al. 2012). Cartoons are effective tools in constructivist point of view as it is easily detected by children. In the process of construction, students first concentrate on the line in the cartoon, then think over every detail, make comments by establishing connection and weave a story in minds putting out the contrast and associations between objects. Kabapinar (2005) reported in her study that the concept of cartoon teaching was effective in constructing focussed discussion where reasoning behind students' misconceptions could be uncovered especially via teachers' thought-provoking questions. She says that, concept cartoons can be prepared as posters or be created in order to make students actively involved in work sheets that can be distributed to students in a classroom. Moreover, concept cartoons help students to construct their thoughts, solve the problem they encounter in their everyday lives, broaden their horizons and provide different perceptions for the events. Balim et al. (2008), in their research, used concept cartoons for Class VII science classes and determined that the concept cartoon have affected students' enquiry learning skill perceptions by helping students to enquire new knowledge with their existing experience. Srinivasalu (2016) by his study says that cartoon can be used as a very good teaching approach as it creates a new insight in reinforcing the learning in classroom and highlight the interactive involvement of the students and gives the opportunity to recall, reflect and apply.

Cartoon as a Tool for Cooperation and Collaboration

The proponent of cooperative learning believes that knowledge is constructed by individual and groups. Cooperative learning is an innovation, where it is easy to organise students into pairs and triads (Jose and Paulose 2011). Constructivist learning environments are organised to include ample opportunities for students to collaborate and exchange ideas with peers and adults. Classrooms are set up to include cooperative situations so that students can talk together freely as well as ask questions and argue with each other about ideas. Separate tasks can be used by individual learners or in collaborative learning settings. However, social interaction is important, when the concept cartoons are used collaboratively. It is also valuable to the learners for clarifying what ideas they hold (Naylor and Keogh 2010). Naylor also says that, concept cartoons appear to be an effective stimulus for a form of argumentation in primary science. Children respond positively to them, engage in focussed discussions within a group and put forward and defend alternative viewpoints. The process of argumentation appears to be purposeful in a constructivist classroom leading

to scientific investigation and enquiry as a way of resolving the argument. Sexton (2010) by his research says that cartoons can be a successful learning and teaching tool for increasing student and teacher insight in the mathematics classroom. He concluded using of cartoons as an effective way to encourage collaborative learning to discuss the advantages and disadvantages of their preferred strategies for solving addition problems and to find out how students approach calculations. Using cartoons in the process of knowledge construction, students question other students' ideas and give their own ideas, formulate and test hypothesis, design experiments, interpret and discuss results; students verify and validate their own ideas by using the cartoons in the classroom.

Dabell (2004, p. 11) suggested how teachers might use cartoons in the classroom. His suggestions include: (i) to encourage discussion and invite small groups to see if they can reach consensus in a collaborative set up and to have a whole-class discussion in a collaborative set up in an attempt to reach a consensus. In the constructivist didactics, collaborative and interactive methods are used to encourage students to challenge and consider different perspectives (Woldab 2011).

Cartoon as a Tool for Reflection

Sharma (2005), states that a constructivist classroom should provide students autonomy and initiative; the teacher should ask open-ended questions and allow wait time for responses. Higher-level thinking should be encouraged by engaging the students in experiences that challenge hypotheses and discussion. John Dewey (1956) and Fosnot (1989) believed education must engage with and expand experience; the methods being used to educate must provide for exploration, thinking and reflection. Teacher can present different cartoons in front of the learners and ask them to think critically and draw conclusions or classify the information. It helps here in eliciting students' thinking and provide as an appropriate stimulus for debate and discussion, and develop the learners' ideas, promote critical thinking and developing of conceptual thinking and reasoning. These type of activities helps the learners to ask their own questions and provide starting points for scientific investigation and enquiry, etc. Typically, a concept cartoon is used as the focus for a group discussion, which can then lead on to investigation to decide which of the viewpoints constructed is the most acceptable. Lochrie, (1992) suggested that, cartoons can be used to initiate classroom discussion and debate, and promote a deeper level of engagement with issues via 'critical thinking'. Oliveri (2007) elucidates that using cartoons can spark thoughtful conversation, and open

the doors for discussing current events, social and moral values in higher classroom. Turkmen (2012) states that cartoons are a door which opens to the imaginary world from the real world and explains that children can fictionalise According to Stephenson and Warwick (2002), concept cartoons can be utilised generally for formative assessment and in this case, students can find out where their learning comes from, by looking back. Moreover, these tools provide opportunities for feedback in the classroom against alternative ideas throughout the learning process and give information regarding how student ideas have changed (Dabell 2008).

Cartoon as a Tool for Negotiation

Selly (1997), says in constructivist terminology, encouraging rather than teaching is used more frequently because individual development cannot be forced. When students worked in small groups on the cartoon activities, they encouraged each other and discussed ideas, which enhanced their learning. The cartoons as a teaching strategy provide structure for interactions, reward students for collaboration and problem solving. Furthermore, cartoons promote class discussion, cooperative learning, individual accountability, positive interdependence, group processing and feedback (Arunraj et al. 2014). Barker (2009) explains that the best way to keep our students interested and engaged in lesson is by making them interactive. Additionally, adapting comics and cartoons into our classroom with correct and applicable activities can encourage students' observational, analytical, and higher thinking skills. In addition, in a constructive classroom, cartoons promote diverse interactions among students and provide a way to reach and engage the students who may have a variety of learning styles. According to constructivist learning theory, in order to learn, students must engage with information and process it deeply enough to fit the new concepts into their views of how the world works. As students interpreted, edited, completed and created cartoons, they interacted intensely with the content, organising, recognising and internalising the concepts. They self-assessed their learning as they tried to put ideas. They made numerous connections to prior knowledge as they searched for appropriate parodies or situations for their original cartoons. These activities reinforced the learning, allowing them to outperform students in the control condition who were not as engaged with the material.

Cartoon as a Tool for Activation

Ramakrishna and Sonia (2012) emphasised various elements of teaching and learning process in a constructivist classroom. Among them developing a situation and

bridging plays an important role as in learning cycle idea *Engage* of Bybees's (1997) 5E models. Developing a situation refers to developing a situation for the students related to the learning process and bridging is done to develop a bridge between what the students already know and what they are expected to learn. The main emphasis here is to stimulate curiosity and activate previous knowledge of the students. Dabell (2004) suggested that cartoons can be used at any point during a class to introduce the topic, to employ a particular situation, to encourage whole class discussion, and to shepherd ideas together. McLaughlin (2001) and Cookson (2003), state that humour is the easiest form of engagement available to teachers because students must pay attention to understand the jokes. Not only can humour maintain student attention, but also it can increase motivation by breaking tension and decreasing anxiety (Guthrie 1999). Using cartoons was an effective pedagogical technique because they created a learning environment in which students experienced a high degree of motivation, enhance memory (Rule 2003), make numerous connections between the new material and prior knowledge through parody and analogy (Furletti 2004). Giunta (2010) accurately explains that humour, such as found in cartoons and comics, which is an important factor for making learning an enjoyable and more importantly, memorable experience. Thus, cartoons are also considered excellent teaching tools in a constructive pedagogical perspective because they not only add humour to a topic but also illustrate the idea in a memorable way additionally, adapting cartoons into our classroom with correct and applicable activities can encourage students' observational, analytical and higher thinking skills.

Conclusion

Research has proved that cartoons can be employed in variety of ways in constructive pedagogical classroom. These include the development of reading skills (Demetrulias 1982) and vocabulary (Goldstein 1986); problem solving (Jones 1987) and enhance motivation (Heintzmann 1989); resolving conflict (Naylor and McMurdo 1990); eliciting tacit scientific Knowledge (Guttierrez and Ogborn 1992) and making scientific ideas accessible (Peacock 1995).

Hyde (2007) says with his brain research that teachers who embrace a variety of learning activities that appeal to multiple learning modalities (auditory sequential, kinesthetic-tactile and visual-spatial) are more likely to get early success for all students. So providing a variety of resources, such as cartoons help them to learn and appeal to multiple learning modalities. By this study we can conclude that cartoon helps the learner as an active participant rather than a passive recipient, and makes learning as a participatory

process, and connects knowledge to outside the school. Based on Vygotskian perspective, the teacher's role is fundamental as the mediator of this process in helping the students to develop the lesson (Sharma 2012) by creating or choosing appropriate cartoons related to the context and tries to stimulate interest and encourage the learners.

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Teaching Chemical Reaction
Focus on Nature of Science

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Abstract

Development of students' understanding of Nature of Science (NOS) is an important aim of scientific literacy. Any science topic can be modified to enhance student understanding about science and how it works. In science classrooms, there should be explicit teaching of the aspects of NOS. In this paper, topic 'Chemical Reaction' has been modified to explicitly teach four aspects of NOS — the empirical nature of scientific knowledge, the creative and imaginative nature of scientific knowledge, the tentative nature of scientific knowledge and scientific inquiry.

Introduction

Teaching nature of science contributes to scientific literacy. The phrase *Nature of Science* typically refers to the values and assumptions inherent to scientific knowledge and the development of it (Lederman 1992). Researchers have revealed that teachers do not intentionally attempt to teach from the perspective of nature of science (Lederman 1999). Teacher's understanding of the nature of science stimulated them to rethink. It is possible to help students learn about NOS during teaching without deviating from the original subject matter. According to Lederman and Lederman (2004) any science activity can be modified to enhance student understanding about science and how it works. They restructured the topic *Mitosis* to help students learn about NOS. Chemical reaction is the core concept in chemistry textbooks and curriculum. There are several assumptions of NOS. In this paper following four assumptions of NOS have been focussed upon by teaching the topic 'Chemical Reaction'.

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Empirical Nature of Scientific Knowledge

Scientists understand the natural world by observing the phenomena in their surroundings (Lederman et al. 2002). Scientists use their senses and instruments to gather data through observations and measurements. Observation of phenomena is possible in the following ways:

a. Empirical evidences derived from the observations of the natural world should be given to the pupils. Use illustrations and examples which are familiar to pupils and take examples from their surroundings. For example, reactions involved in burning a candle, photosynthesis, rusting, fizz in soft drinks.

b. Teacher can plan the activities or experiments that can be done in the classroom or in an unspecialised laboratory, with easily available materials. The process of chemical reaction can be observed by performing the following experiments:
   (i) Calcium Carbonate + Turmeric
   (ii) Baking Soda + Vinegar in Bottle (Balloon experiment)
   (iii) Sodium bicarbonate + Sodium Hydrogen Sulphate
   (iv) Lead nitrate + Potassium Iodide
   (v) Citric acid + Baking Soda
   (vi) Sodium Hydroxide + Hydrochloric acid
   (vii) Sodium Hydrogen Carbonate + Hydrochloric acid (Jayathirtha, 2013)

   For example, when students mix two or more chemicals (e.g., turmeric + cooking soda, vinegar + cooking soda, etc.) they get bubbles, clear solution, change in colour, etc. Teachers should ask them to carefully record their observation and identify the changes that occur when two chemicals react. Carefully planned questions by teachers can promote the learning of particular aspect of NOS (Lederman and Lederman 2004).

c. Concrete representations are important to explain the abstract concept to students. The second important point in the chemical reaction is that it involves breaking of the bond between atoms in the reactants; atoms rearrange and form new bonds to make the products. Teachers should be careful in demonstrating 'structural representations' of this science concept to help students comprehend the scientifically correct meaning. Scientifically correct representations of molecules can be shown to them in a video film or power point presentation. 2D model of atoms and molecules can have aconceptual disadvantages for students. 3D models of atoms and molecules help student teachers visualise the organisation of them (Eggen and Kauchak 2004). 3D models lead to a better understanding of the concept.

d. Students should be aware of the crucial distinction between observation and inference (Lederman and Lederman 1992). Observations are the statements about the phenomenon that are directly accessible to senses. Inference is cause behind the phenomenon that we predict based on our observation.
   (i) The teacher should first tell them to carefully observe the signs of chemical reaction. Teacher's questions should stimulate students to reason, why it happens. For instance, "how can we say that these are the signs of chemical changes?", "Why are the signs not representing a physical change or change in state of matter?" It may lead to elicit the inference that 'when you cannot get back the original substance it is a chemical change. The process of chemical reaction is irreversible'. When students answers these questions, it will allow you or them to understand how by using these observations they can make inferences. From these observations students will be able to draw inferences, such as "bubbles, effervescence, change in state of matter, precipitate, colour change, vapour, liberation of heat, temperature change and absorption. All these signs represent a chemical reaction, i.e., formation of a new substance. And the process of chemical reaction is irreversible".
   (ii) The teacher should make a connection between the observations of the students during experiments and the concept of chemical reaction given in the textbooks (Eggen and Kauchek 2004). Intuitively, the students cannot make sense that new substances are formed during chemical reactions. These signs arise due to the formation of a product, i.e., new substance.

Creative and Imaginative Nature of Scientific Knowledge

Science is not a completely lifeless and empirical activity. In the process of development of scientific knowledge, scientists also use their imaginative power and creative thinking. For example, structural representation of chemical reaction by atoms, ions and molecules is not directly observable. It is accessible only by imagination. Imagination is a key component of advances in chemistry at the research level (Bucat and Mocerino 2009).

While conducting scientific inquiries sometimes the teachers put a question mark and say "what do you think? What further can be done?" The students will then come up with their original ideas and that will make a point that inferences

are a product of human imagination and creativity.

During empirical work scientists gain insights and produce their original scientific ideas. These ideas are always subject to verification through experimental testing (Siddique 2008).

Tentative Nature of Scientific Knowledge

Scientific knowledge advances in the light of new evidences. This knowledge, includes 'facts', theories, and laws which are subject to change. Old evidence is reinterpreted in the light of new theoretical advances. Thus, the laws of science are never viewed as fixed eternal truths. Even the most established and universal laws of science can be modified in the light of new observations, experiments and analysis (Lederman and Lederman 2004).

Consider the tentative nature of science while planning instructions or making instructional decisions. For example, explain the work of scientists, how they challenge the old beliefs with their new observations, the processes of science used by them (Wellington 2000). The development of different theories about atom promotes acceptance of the tentative nature of scientific knowledge. Lavoisier experiments in the discovery of oxygen and replacement of the 'phlogiston' theory can be discussed.

Scientific Inquiry

Scientific inquiry is a unique way by which scientists explain the world in a systematic way. The scientists begin with a question based on anomalous data, inconsistencies in proposed explanations, or insights from observations. After some explorations, the scientists propose a hypothesis from predictions, which may be deduced from inference. Experiments or tests are designed to test the hypothesis. Analysis of the data and results are often communicated to scientific community through publication. There is no strict order in these various steps. Through observations and experiments, empirical evidence, careful analysis and drawing inference they provide scientific explanations (Bybee 2002). This summary of conducting scientific inquiry by scientists can provide insights for teachers and the representation of inquiry in science curriculum and classroom. Teachers can teach scientific inquiry in the following ways:

(a) Scientific inquiry as an important pedagogical strategy can be understood with investigation of laboratory experiments. Students will learn with their personal experiences — this is an accepted teaching practice. For example, for understanding chemical reactions, when students mix two or more chemicals (e.g., turmeric + baking soda, vinegar + baking soda, etc.) they get bubbles or a clear solution or see a change in colour, etc. The teacher should ask them to carefully observe the signs of chemical reaction

and draw inference with careful observation of these signs during different chemical reactions. With these observations the students will learn to infer signs, such as bubbles, effervescence, change in state of matter, precipitate, colour change, vapour, liberation of heat, temperature change and absorption. All these signs show that there is chemical reaction taking place.

In next session students can plan their own investigations in groups. Observations of the previous sessions' experiment may provide the insight for further investigation. During this further investigation, they will choose the question to answer. Then they will refine their questions by discussing with other group members and teachers and convince other group members about their questions for investigation. Provide them some lab materials for experiments. Students will experiment in their group to find the answers to their questions. They will communicate their results as scientists do. In this communication other group members can raise doubts or questions on their scientific inquiry.

b. The factor which keeps varying is independent variable and its effect on the certain factor is dependent variable. This is quite crucial for scientific inquiry. When students compare their ideas and give the reason why their observation is similar or different, the teacher should play the role of a guide. The teacher should tell the students that the amount of reactant (independent variable) varies, so its effect on dependent variable (amount of bubbles) may vary. If we consider the idea of a simple investigation to be done by students, the teacher should tell them that in order for such an investigation to be meaningful, they must keep certain factors (variables) the same, for example, while doing these experiments the temperature and pressure should be constant and then other factors, such as amount of reactant, can be changed. The teacher can discuss the following points — Which of the factors can you change? Which one have you kept the same? What is the effect of the change on the observation? When you kept one of the reactant constant did the other change? And it may then be explained, what you changed is independent, what variation you observe due to effect of change in independent variable is called dependent (Wellington 2000).

Conclusion

There is no explicit statement regarding these aspects in the existing general science curriculum or textbook (Lederman and Lederman

2004). The students do not learn NOS implicitly simply by doing science activities. Rather, the aspects of NOS a science teacher wants to emphasise, need to be planned and explicitly taught in the science classroom.

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Digital ICT in Education
Deconstructing Myths and Realities

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Abstract

Myths play a powerful and significant role in curriculum and educational practices. They generate a range of responses from the teachers, teacher educators and educational researchers. Some of us seek to challenge and transform persistent myths associated with the curriculum; others may focus on interrogating myths understood as popular misconceptions in teaching and learning; still others consider myths as powerful narratives and stories that evoke timely or timeless messages about current educational practices. Myths can be productive learning tools, as they create and sometimes recreate narratives that are neatly wrapped around culturally based messages and truths. However, many of them have a darker side; some are irrational and others are beguilingly but ultimately dangerously attractive.

Deconstructing the mythical thinking about digital ICT is highly significant for promoting critical thinking, constructing sound knowledge and preventing ignorance-based mistakes in educational practices. This paper attempts to create awareness among the educators and researchers about how our beliefs and views on ICT in education are built; invites them to critically consider to what extent these beliefs and views have rational and evidence-based grounding; and emphasises the need to identify and challenge the myths of ICT in education that prevent productive and evidence-based approaches to current educational problems.

Introduction: Computer as a Panacea

Education is a complex social endeavour where problems related to teaching and learning do not have any shortcut answer or solution. But educators are tempted to look for easy means to resolve many of the

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deep-rooted problems encountered in the profession. The discourse of technology particularly those of ICT have contributed significantly to the idea of computer as a panacea for educational improvement. In 1922, Thomas Edison predicted, 'the motion picture is destined to revolutionise our educational system and in a few years it will supplant largely, if not entirely, the use of textbooks'. This did not happen, and the use of textbook became more predominant than ever before in education. In 1950s, B.F. Skinner's teaching machine also promised much more than it could deliver. However, new digital technologies powered with ICT live up 'Edison's optimism' for replacement of textbooks; but surely not with motion pictures or teaching machines. The strong advocacies of both corporate and governmental agencies for integrating ICT in education has impelled both policy makers and educational practitioners to refer to computer-related technologies as a solution for all the challenges of education.

Ornellas and Sancho (2015) analysed a variety of literature on ICT and highlighted how the notion of computer as a panacea for educational improvement is embedded in the discourses of technology in education. A brief summary of their analysis is recounted here. In 1979, Seymour Papert stated that there was no evidence to show that introduction of television, movie, language labs and other educational hardware have made a significant difference in the field of education; nor did the innovative curricula of 1960s. But he asserted that the powerful computer could have done so.

Such hopes got a powerful push when in 1995 Bill Gates and associates claimed that Internet was going to provide 'seemingly unlimited information, anytime and anywhere'; that it 'will bring together the best work of countless teachers and authors for everyone to share'; and that it 'will help spearhead educational and personal opportunities even to students who are not fortunate enough to enjoy the best school or the greatest family support'. Thus, all children will be encouraged 'to make most of his or her native talents'. Here the position is very simple: 'give Internet access to everybody and most educational problems will be solved'.

In 2006, Sanna Jarvela claimed that ICT can increase authenticity and interest in learning; build virtual communities; help to share perspectives among students with different expertise; provide peer support and benchmarking practices in different field; facilitate the use of technology-supported inquiry approach and problem-based models; provide innovative ways of integrating 'just in time' support and interaction. All these claims are well and good but could be true only in a rich pedagogical environment. A decontextualising of these claims to the contemporary teaching and

learning practices would bring out an educational myth: 'use ICT in school and in the home and all learning problems will be solved'.

And in 2011 Heuston affirmed that we are approaching the 'final miracle'; schools and educators are 'finally moving into position to introduce new technologies working at a speed of light that are capable of providing educational excellence and equity to all children on the globe almost overnight'. The assertion is very clear: buy the newest digital technology today and all your educational (and social) problems will be solved tomorrow.

Educationists, practitioners and technology professionals up hold different perspectives on the possibilities and pitfall of computing technologies in education. Bigum and Kenway (1998) identified and described four such perpectives: (i) *Boosters,* who were optimistic advocates of computers in edcucation; (ii) *Doomsters*, who dwelled on the problems; (iii) *Anti-schoolers,* who predicted the end of the 150-year-old model of schooling; and (iv) *Critics,* who were aware of the obstacles and threats. In the last two decades 'the number of boosters has considerably increased. Doomsters' voices seem to be fading, anti-schoolers are gaining the greatest foothold in higher education and home schooling, and critics continue to argue for a more rigorous and evidence-based approach to the benefits and drawbacks of digital technologies and their adaptation in educational policy and practice (Sancho 2010).

One can have one's own perspective on the use of digital technologies in education. The critics follow an evidenced-based approach to judge the pros and cons of ICT and its adaptation in the educational policy and practice. They search for the best ways to use and integrate digital technologies and focus on understanding how this kind of technology is transforming people's lives, ways of learning and interests. Nonetheless, a dispassionate scrutiny of the weak and strong contributions of ICT to education is needed to deconstruct a set of unfounded beliefs and myths.

Conceptualising Myths

Oxford dictionary depicts myth as a traditional story that describes the early history of a people or explains a natural event; a widely held belief that is not true. Myths can be construed 'as sources of enriching origins or as something darker, where thoughts turn to false ideas or lead people in the wrong direction' (Ornellas and Sancho 2015). According to Arthur W. Combs, people behave according to their beliefs and the damage done to human thought and actions by the myths people hold is incalculable. He states that 'Myths are major factors behind inefficiency of institutions, breakdown in communication, and failure to cope with many modern problems. In educational

thinking and practice, they create a continuous barrier to innovation and change'.

In his collection of essays, *Mythologies,* Roland Barthes (1972) examines myths of bourgeois culture and dissects their functioning in everyday practices. Barthes considers myth as a system of communication; a message or a mode of signification. He shows how myths can easily become ideologies, naturalise certain norms, and prevent people from being reflective about them. For Barthes, certain myths remove history, thus giving the impression that something simply exists and does not need to be questioned; myths allow the mere statement of fact to emerge and thus a certain idea of unquestionable truth develops. On the basis of these examples, one can see how dangerous the myths can be for education.

However, myths can help to explain a practice, belief or natural phenomenon. They are sustained in popular beliefs or traditions that have grown up around something or someone. The philosopher Willard Van Orman Quine argued that all basic epistemological assumptions, be they sensu stricto myths or conceptions that there are physical objects or phenomena, are mythical in nature. The myths may differ from each other in degree, but have the same nature or perform the same function (cited in Ornellas and Sancho 2015).

According to Barthes, myth is not defined by the object of its message, but the way in which it utters this message: there are formal limits to myth; there are no 'substantial' ones. Hence, everything can be a myth. But there are no eternal myths; for it is human history which converts reality in to myth, and it alone rules the life and the death of mythical language. Ancient or not, mythology can only have a historical foundation, because myth is a type of speech chosen by history: it cannot possibly evolve from the 'nature' things (Barthes 1972). The myths of ICT in education considered in this paper are in tune with the above conceptions about myths. The analysis is centred on the major assumption held by a good number of policy makers, and educational professional that digital ICT will effectively improve education per se.

Making of ICT Myths in Education

The term technology has a wide range of meanings. Gentry (1995) analysed diverse conceptions about technology offered by scientists, educationists and educational technologists. His synthesis of all these conceptions considers technology as 'the systemic and systematic application of behavioural and physical science concepts and other knowledge to the solution of problems'. He asserted that use and misuse of technology depends on the values of those who employ it; the application of technological solutions to one problem may create other problems which may be more serious than

the original problem; applications of technology should be selected and/or continued only after determining that desirable consequences outweigh considerable consequences.

However, most educational literature on computers and ICT, use the term 'technology' to refer to a specific kind of technological development, i.e., a set of sophisticated digital tools. This view of technology, according to Ornellas and Sancho (2015), creates unpredictable consequences. For instance, it fosters the idea that technology is only computers, the penultimate digital gadget. Such a belief leads the teachers and students to think that they do not use technology if they are not in front of a computer or a mobile phone. My own experiences with the pre-service teachers ratify this. When asked about 'educational technology' they used to refer to computers, mobile phones and other digital ICT gadgets. Few would refer to application of scientific knowledge to the solution of educational problems. They do not take into consideration the different technologies that over the years have been turning the school into what it is today. This may be true for the present day in-service teachers too.

Why do student teachers refer only computers and digital gadgets to 'technology'? Perhaps many of these new-generation learners are born and bought up in the environment of digital technologies and may not be acquainted properly with the concept of educational technology at large and its implications in educational thinking and practice. Another reason could be ubiquitous nature of the ICT that has made other technologies invisible to the users of computers and Internet technologies. Mark Weiser (1990) argues that 'the most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it'.

However, when the technologies 'disappear' they can also become dangerous. Because, the people tend to think that technological developments enjoy an autonomous power; and look upon the technologies almost as natural force, beyond human will and responsibility. They may also take it for granted that the power of technologies will automatically bring qualitative improvement in different walks of their lives. This reductionist and uncritical view of technology prevent people from seeing that technology is not a 'thing' in the ordinary sense of the term, but an ambivalent process of development suspended between different possibilities (Aznar 2005, Hanson 2013, cited in Ornellas and Sancho 2015).

Major ICT Initiatives in India

In India, the need to employ educational technology to improve the quality of education was prominently figured in the National

Policy on Education 1986–1992. This led to launching of two major centrally sponsored schemes: (i) Educational Technology (ET) and (ii) Computer Literacy and Studies in Schools (CLASS). In 2004, Government of India launched a more comprehensive scheme — Information and Communication Technology at Schools. The role of ICT in school education is highlighted in the National Curriculum Framework 2005. Use of ICT for quality improvement also figures in Government of India's flagship programmes on education, Sarva Shiksha Abhiyan (SSA). Again, ICT has figured comprehensively in the norm of schooling recommended by the Central Advisory Board of Education (CABE), in its report on Universal Secondary Education, in 2005.

Inspired by the 'tremendous potential of ICT for enhancing outreach and improving quality of education' the Government of India brought out a National Policy on ICT in School Education in 2012 and accordingly in 2013 NCERT formulated a curricula for ICT in education. In 2015, Prime Minister of India launched the Digital India programme with an aim to ensure that government services are made available to citizens electronically by improved online infrastructure and by increasing Internet connectivity. The other initiatives, policies and programmes that are followed include studying web called SWAYAM for offering free online courses, National e-Library; National Mission on Education through ICT; e-Pathshala; e-PG pathshala, Shala Darpan; Swayam Prabha DTH educational channels, and National Repository of Open Educational Resources.

The policy narratives on digital technologies reflect several assertions about ICT in education that resound some of the mythical thinking referred above and those that are to be deconstructed later in this paper. For instance, the National Policy on ICT in School Education aims at 'preparing youth to participate creatively in the establishment, sustenance and growth of a knowledge society leading to all round socio-economic development of the nation and to be geared for global competitiveness'. As per the policy document (Government of India 2012) ICT has the following potential to respond to the various challenges of the Indian education system:

1. ICT can be beneficially leveraged to disseminate information about and catalyse adaptation, adoption, translation and distribution of sparse educational resources distributed across various media and forms. This will help promote its widespread availability and extensive use.
2. (Hence) there is an urgent need to digitise and make available educational audio and video resources, which exist in different languages, media standards and formats.

3. Given the scarcity of print resources as well as web content in Indian languages, ICT can be very gainfully employed for digitising and disseminating existing print resources like books, documents, handouts, charts and posters, which have been used extensively in the school system, in order to enhance its reach and use.
4. ICT can address teacher capacity building, ongoing teacher support and strengthen the school system's ability to manage and improve efficiency, which have been difficult to address so far due to the size of the school system and the limited reach of conventional methods of training and support.
5. There is an urgent need to develop and deploy a large variety of applications, software tools, media and interactive devices in order to promote creative, aesthetic, analytical and problem solving abilities and sensitivities in students and teachers.

The assumption is made clear in the mission statement of the policy that 'ICT and ICT-enabled activities and processes (will certainly) improve access, quality and efficiency in the school systems. In other words, infusion of ICT in education would automatically resolve all the problems in the field of education and would even ensure all round development of the country.

The curricula for ICT in education has gone a step ahead. It claims that "A decade long infusion of computers and more recently ICT, have demonstrated varying impacts on learning". The statement indicates that whether the use of computers and ICT in school education has led to a substantial gain in the learning achievement of the students at different stages of education is yet to be established empirically. A more interesting and critical claim made by the ICT curricula is that "For the students, it (ICT) is an initiation into creativity, problem solving, and an introduction to the world of information and technologies which could also shape career pursuits" (CIET 2013). It may be true for some of the students who are educated to care for a critical understanding of the knowledge, skills and attitude they develop.

However, this author's experience as a teacher educator is that most of the pre-service teachers who have acquired considerable skills in the use of ICT tend to do their learning assignments in an easy way using the 'cut and paste' options of the technology without even reading and understanding the material they have downloaded from the Internet. It is beyond imagination to think about what they would do in the classrooms when they become teachers in the schools. On the other hand the huge turn-out of the IT graduates and post graduates that the author witnessed in recent interviews held for a few posts of computer typists for various projects itself reveal the gravity of

unemployment prevalent among the IT graduates in the country. Hence, it would be mythical to think that learning ICT in schools will surely enable the students to pursue a career in any sector.

Myths about Digital ICT in Education

The current buzz about ICT is due to its inherent potential, such as abilities of the technology to reach large number of individuals (e.g., radio and TV), interaction (e.g., telephone, social networks), rich media transmission (e.g., DTH TV channels), integrating all forms of media (e.g., multimedia), huge storage capabilities, quick search (as in computerised databases), and ubiquitous access (anywhere at any time). Of course ICT can play a significant role in education. But the current discourse on the role and value of ICTs in education disseminates many mythical beliefs among the teachers, trainers and students about the potential of these technologies and this necessitates a critical rethinking. The most commonly held myths that traverse these narratives characterise ICT 'as computers and Internet'; and 'as a panacea for all ills in education'. The other myths are like this: 'ICT can replace teachers and schools'; 'Effects of ICT are definite'; 'ICT is a monolithic entity'. However, the three myths identified and deconstructed by Ornellas and Sancho (2015) bear much significance for the prevailing excitement about ICT in Indian education. The analysis of myths that encompass more or less the ones referred above would provide an opening to the educational professionals in deconstructing the myths in education at large.

Myth 1: Providing schools with ICT is enough to improve education.

This myth embraces many assumptions about the role of digital ICT in teaching and learning, such as

(a) top-down theories and policies are sufficient for making decisions about introducing new devices into schools,
(b) digital ICT-based teaching allows interactive, creative, adaptive, constructivist and motivating learning and
(c) digital ICT is a driving force of innovative teaching.

Over the last three decades most of the countries in world have been implementing diverse plans and programmes for integrating ICT in education. The reasons to justify this kind of educational policy in the Western countries are adjustment of the school system to the characteristics of the information society; getting students ready to face the digital culture; increasing and improving the quality of teaching processes and fostering innovative teaching methods and materials (Ornellas and Sancho 2015).

The brief description of the initiatives in India presented earlier affirms that the overarching justification for the policy on ICT in education is nothing but 'preparing youth to participate creatively in the establishment, sustenance and growth of a knowledge society'. The policy perceives ICT as an 'omnibus support system for education'. The explicit and implicit agenda is to 'develop alternate modes of education, continuing education, teacher capacity building, and information systems for efficient management of the school system'. In order to implement the policies and programmes of the government to integrate ICT in education, the stakeholders involved in school education are repeatedly proposed to use the ICT tools in the teaching and learning processes. Accordingly directions were given to the state governments and Boards of Secondary Education to develop their own ICT curriculum, ICT programmes, and evaluation schemes as well as to institute an ICT literacy programme across the school classes. Many of the states have started implementing the provisions of the ICT policy.

In this context it would significantly consider some of the findings of the studies on integration of ICT in education in other countries. Studies from different contexts in the American and European countries show that in spite of the considerable efforts made and the resources allocated for enhancing the use of technology to support learning, the expected transformations or improvement of learning as a result of using digital ICT have not been confirmed. And, there is little evidence to sustain that investments in digital technologies have a significant return in teachers transforming their teaching practices or producing gains in student achievement. Providing access to digital ICT has not led to either substantial changes in teaching practices or increase in student academic achievement (Ornellas and Sancho 2015).

The reality in India may not be different. The scenario of ICT integration in teaching learning process in my organisation, Regional Institute of Education, Mysore, a constituent unit of NCERT can be taken as a case. Over a decade or so the Institute has developed a comparatively good digital infrastructure. With three computer application labs, an audio-visual studio and several smart classrooms, the Institute provides ICT education to all of its student teachers especially at the undergraduate level. They have free access to Internet and Wi-Fi connectivity in the campus including library and the hostels. Almost all the students have their own smartphones. The heads of the departments and faculty members are provided with laptops and desktops, respectively, and Internet connectivity through broadband and Wi-Fi is also available to them.

In-spite of the availability of these advanced digital technologies to both faculty members and students the teaching learning process remain to be conventional at large. Even the faculty members who are well-versed in ICT skills focus on information delivery through lectures and technologies. The evaluation process is still dominated by paper-pencil tests and written assignments. Diminishing standards in the quality of students learning is a point of discussion among the faculty members, especially in the centralised valuation camps at the end of every semester. All these are certainly a concern for an institution like RIE to reflect upon in this digital age.

However, research-based evidence is required to substantiate that the efforts made in the country for the last two or three decades to employ educational technology or ICT to enhance the quality of education have really improved or not the teaching practices and made substantial gain in students' achievement. Infusion of ICT in teaching learning may have changed the nature of the learning experience, but it is significant to understand the extent to which the use of ICT has influenced a range of learner outcomes and what aspects of the ICT-augmented experience appear to have made a difference. As of today there is no comprehensive field-based study available on the Net that discerns a direct, causal relationship between ICT use and attainment, although many studies reported improved attainment as one of the number of outcomes of increased ICT use in an experimental setting.

Thus, it is wise to keep in mind that the use of the 'current and emerging ICT tools' in themselves do not automatically result in the development and implementation of new approaches to school or academic knowledge, in the transformation of teaching and learning methods or development and implementation of new ones, and in the solution to educational problems of the country. It would be futile to think that mere availability of a wide range of digital resources for teaching learning will automatically lead to 'transformation of classrooms into ICT-enabled classrooms' and make a significant change in the academic attainment of the students in comparison with well-planned learning experiences executed without the support of digital technologies. According to Ornellas and Sancho (2015), there are several other elements to be considered if digital ICT is to be implemented in schools from an educational innovative perspective. These elements are

- an adequate source of funding for acquiring and maintaining the needed infrastructure, with external support to rapidly solve the technical problems,
- an organisational environment that supports and propels technology-driven innovation,

- the professional development of teachers implemented from a practical-critical perspective and related to the development of school-based improvement projects,
- a favourable predisposition from the teachers towards the integration ICT into their teaching practice,
- a deep reorganisation of school time and space and a redistribution of ICT in the different learning environments and
- a holistic vision of the curriculum that facilitates the development of transdisciplinary learning experiences that enhance authentic learning, problem-solving activities, development of higher-order thinking skills and collaborative learning.

Above all a strong academic leadership is required for every educational institution to steer the organisation to achieve its educational vision. In short, the digitally driven educational innovation is virtually impossible if the rest of the system remain unmovable.

Myth 2: Students learn better and more with ICT because they are digital natives.

Introduced in 2001 by Marc Prensky, the concept of digital natives has been proliferated in the literature on young people and digital technology over the past decade. The other terms that correspond to the digital natives are net generation or millennials. Prensky described 'digital native' as the generation who have been born since 1980 and grown up with new technology. He posits that this generation has specific characteristics of having spent their entire lives surrounded and using computers, videogames, digital music players, cell phones, 24×7 access to Internet and digital tools. They think and process information differently and are used to getting information on the World Wide Web at the press of a key rather than textbooks and libraries. In contrast to the digital natives, Prensky describes 'digital immigrants' as the generations who were not born into the digital world but have become fascinated by and adopted many or most aspects of the new technology (Darbha and Rao 2016). The International Telecommunication Union (ITU 2013) defined digital native 'as a youth, aged 1,524 inclusive, with five years or more experience of using the Internet.

In India, the notion of digital natives is not yet widely found in the literature on digital learners. It is argued that India's digital journey is merely of 20 years or less. Hence, unlike the Western nations, only those who were born after 1995 can qualify as digital natives and they are not yet part of the work force or are just making an entry. Nonetheless, this generation forms a decisive part of the consumer and customer base for most of the organisations and are

the current target segment (Darbha and Rao 2016). As per Measuring Information Society Report 2016 (ITU 2016), India stands at the 138th position in the global ranking with an ICT Development Index (IDI) of 2.69. Republic of Korea occupies the top IDI ranking with value of 8.84. Two other countries' in the Asia-Pacific region — Hong Kong and Japan — also rank in the top 10, along with seven countries from Europe: Iceland, Denmark, Switzerland, the United Kingdom, Sweden, the Netherlands and Norway.

According to the literature on digital learners the contemporary students are supposed to be digital natives who are fluent with digital technology and possessing sophisticated technical skills and learning preferences for which traditional education and teachers (digital immigrants) are unprepared (Ornellas and Sancho 2015). In the world of Prensky, digital natives have been conditioned by their technological environment to expect immediate responses. They prefer random non-linear access to information (i.e., hyperlinks), and have a preference for images over text-based content. Described as multitaskers, they are comfortable being engaged in several tasks simultaneously. They are also characterised as being impatient with slower, systematic means of acquiring information and knowledge, and expect instant response and gratification or reward from the technologies they use. Additionally, according to these theories, they are highly adaptive, function best when networked, and use a range of technologies to network with their peers (ITU 2013).

There are several other assertions about the young generation who have grown up immersed in the new technologies. Smith summed up all such statements in to eight dominant digital native claims: (i) Possessing new ways of knowing and being; (ii) Driving a digital revolution, i.e., transforming the society; (iii) Innately tech-savvy; (iv) Multitaskers, team-oriented and collaborative; (v) Native speakers of the language of digital technologies; (vi) Embracing gaming, interaction and simulation; (vii) Demanding immediate gratification; and (viii) Reflecting and responding to the knowledge economy (cited in Ornellas and Sancho 2015). Prensky claims that 'the digital natives exceed what many adults know or even consider worth knowing; therefore, educators and educational system need to invent digital native methodologies for all subjects at all levels, using our students to guide us'. But the critics say that there is no research-based evidence to substantiate the digital native theory and its claim about the link between young people and ICT. Therefore, there is a need for a more measured realistic approach to investigate the nature of today's learners and its implications for education (Ornellas and Sancho 2015).

The analysis of studies and review of literature on young people

and ICT made by Ornellas and Sancho reveals that contrary to the imagined collaborative communities of content creation many young people's engagement with technology is far more passive, solitary, sporadic and unspectacular, be it at home or in school; that today's learners, regardless of age, are on a continuum of technology access, skills, use and comfort. Although many of the students are fluent in digital ICT technical skills, they have very little understanding of how to create a network for learning, how to manage information overload, how to work collaboratively, how to make information work for them, how to use information legally and ethically or how to successfully use the Internet and other research tools. In short, though the digital technologies are an important part of their lives its role in learning remains rather less expansive and empowering than the digital native claims proclaim.

It is true that the new generation has more affinity with the ICT tools than their elders. But some of the so called 'digital immigrants' can be fluent in digital technologies, some young people can be naïve and unsophisticated in their use. Hence, the propagated dichotomy between the digital natives and digital immigrants can be a dangerous myth as it put forth some compelling implications for how students, teachers and teacher educators to make use of ICT in teaching learning processes. The mythical assumption can lead the people to believe that the younger generation has easily transferable skills, which the elders do not possess. Therefore, research-based evidence is required to substantiate the real nature of the digital learners and their relationship with digital technologies.

Myth 3: Information society people are cleverer and better informed because they have unlimited access to information.

An information society is construed as a society where creation, distribution, uses, integration and manipulation of information is a significant economic, political and cultural activity. Its main drivers are digital ICTs, which profoundly change all aspects of social organisation, including economy, education, health, warfare, government and democracy. The People who have the means to partake in this form of society are sometimes called digital citizens. Yoneji Masuda used the term 'information society' to describe the significant social changes taking place in the second half of the twentieth century. The changes resulting from the huge dissemination of digital ICT in all areas of human life have been described variously: 'network society', 'information age', 'global society', and so on. But the two terms 'information society' and 'knowledge society' used interchangeably to characterise the change driven by

the ubiquity of digital ICT are very common in the digital discourse.

The ubiquitous Internet has made the access to information easy, fast and diversified. Now we are in a deluge of information which is flooding us. But simply having access to information does not mean that we have become more knowledgeable than ever. Carr (2010) observes that the information overload has a profound impact on people's ability to pay close attention to one thing over a prolonged period of time, and that can have a significant effect on the way people learn and make sense of information.

The information stored in human brain will not automatically convert into knowledge. The individual has to decode, organise, criticise, incorporate and transform it, and give it meaning, and generate new knowledge and understanding. Conversion of information into knowledge entails a mastery of certain cognitive, critical and theoretical skills that are precisely what the students in the contemporary societies need to develop. However, we cannot assume that this process will be automatically fostered by ICTs. Simply providing access to information is not enough. The students should be able to determine what information they need, what information they want access to and why, how to select and give meaning to it and how to apply it ethically in a given project.

The question of information load in education is not new. It has been much debated and discussed in the past. In 1992, the Government of India appointed a National Advisory Committee to advise on improving the quality of learning and to suggest ways to reduce the academic burden on school students. The committee observed that mechanical burden like the gravitational load of school bag on the children was a significant concern to be addressed, but the information load in the textbook and the burden of non-comprehension was equally cruel. The report of the committee states that the 'explosion of knowledge' idea prevents us from appreciating that leaning is not the same thing as storing information about different subject (Government of India 1993). Following the guidelines of NCF 2005 the information load in many of the textbooks has been reduced to a great extent. But deluge of information caused by the Internet reinvigorated the problem of non-comprehension among the new generation learners.

Therefore, what is needed right now is to help the students to decelerate, decode, and re-signify the informational deluge. The educators and educational institutions that focus more on information transmission through lectures or digital technologies need to review their functions. They should understand that students do not require so much of information, whether it is digital or printed. What they really need is thinking tools to know how to search for relevant

information, evaluate it, select it, structure it and incorporate it into their prior body of knowledge.

We have created many curriculum frameworks for school education, teacher education, and one for ICT education too. But what we did not develop is "frameworks for interpretation and thinking tools that allow students to: (i) compare and locate the relevant information and the accumulated knowledge; (ii) recognise the different codes and languages and to learn to use them to express their insights and arguments; (iii) make ethical judgments and continue learning throughout their lives' (Ornellas and Sancho 2015). The real challenge is to teach the students to navigate the digital ocean without being submerged by the information deluge, construct meaning of things they learn, and transform information and experience into knowledge by linking to real life situations. The digital ICTs have immense potential to depict and visualise concepts that children learn from textbooks. However, just like a picture or drawing cannot supplant a real object a virtual image, animation, or online video does not substitute an experience in real life setting.

Conclusion

There are deep rooted myths about ICT in education. A few of them have been deconstructed in this paper. There may be several other myths about the digital tools in education which need exhumation. Such mythical discourses are created mostly by people with little knowledge about the complexity of educational systems, but certainly with some interest in the development and profit due to digital ICT. The educational research that places too much emphasis on ICT tools and ignores rest of the components of education has also contributed to this mythical thinking.

The mythical thinking about the ICT has several dangerous consequences for education: (i) it feeds educators and policymakers and practitioner' ignorance; (ii) it prevents scholars practitioners and policymakers from looking for the real educational problems; (iii) it gives families the illusion of providing their children with the best possible education; (iv) it can guide investment to a single angle forgetting important, even fundamental, areas; and (v) it prevents complex and sound analyses and responses to today's educational problems, needs and challenges (Ornellas and Sancho 2015).

Oppenheimer's (2003) account of the state of education in America highlights the failure of the technology to improve the quality of education. He observes that the essentials of learning have been gradually forgotten and that they matter much more than the novelties of technology. Every time we computerise a science class or shut down a music programme to pay for new hardware, we lose sight of what our priority should be: 'enlightened basics'. He found

that in excellent schools, in which computers play a peripheral role, the tried-and-true methods of progressive education — inquiry, exploration, hands-on learning and focussed discussion — do more to develop students' intellectual capacities than technological gadgetry does.

The argument is not for removing computers from the classrooms and discouraging integration of ICT in education, but for a relook at what can and cannot be accomplished with the enormous investments they require. Policymakers, curriculum planners, teacher educators and teachers cannot ignore the basics: good teaching, small classes, critical thinking, meaningful work and the human touch. An uncritical approach to the process of education and implications of use of digital technologies in teaching learning processes can lead to mounting myths in education that can go counterproductive. The readers of this paper are invited to deconstruct and challenge the current and emerging myths and unsubstantiated epistemological assumptions about digital ICT and other aspects of education.

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Educational Challenges of the Minority Educational Institutions at Odisha

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Abstract

Education for all is an aspiration and commitment of India since the inception of the constitution. The journey of making education a fundamental right at the elementary level is a proof which indicates the seriousness and commitment of the nation. In spite of the efforts taken, accessibility to quality education for all continues to remain a vision. To begin with, it is necessary to identify where the standard of education of the minorities lie. At the same time, it is pertinent to understand that India is constituted of a diverse community wherein the challenges in each community are unique. The minority communities having a distinct religious, linguistic and cultural background are a persistent source of concern as they continue to lag behind in educational progress. Many a time, these challenges are attributed to isolation and disadvantaged situation as seen in the government documents, reports and literacy census. These necessitate for exploration and critical analysis of the actual position that exist particularly in the educational sector. On the background of the issues raised, the study was confined to Muslim and Christian minority schools of Odisha at the elementary level, selected by purposive sampling and analysed, both quantitatively and qualitatively. The findings indicate that there is a challenge in the areas of infrastructure, teacher appointment and lack of in-service professional development opportunities. Isolation from the mainstream society in the larger context is yet another challenge. Findings are discussed for the overall educational development that has an implication for various other minorities also.

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Introduction

The expression 'minority' has been derived from the Latin word 'minor' and the suffix '*ity*', which means 'small in number'. According to Encyclopedia Britannica, Minorities means "group held together by ties of common descent, language or religious faith and feeling different in these respects from the inhabitants of a given political entity". The Oxford Dictionary defines minority as a "smaller number or part; a number or part representing less than half of the whole; a relatively small group of people, differing from others in race, religion, language, or political persuasion". A special Sub-Committee on the Protection of Minority Rights appointed by the United Nations Human Rights Commission in 1946 defined 'minority' as those "non-dominant groups in a population which possess a wish to preserve stable ethnic, religious, and linguistic traditions or characteristics markedly different from those of the rest of the population". Adopted by consensus in 1992, the United Nations Minorities Declaration in its Article 1 refers to minorities as based on national or ethnic, cultural, religious and linguistic identity, and provides that States should protect their existence. However, there is no internationally agreed definition as to which groups constitute minorities. It is often stressed that the existence of a minority is a question of fact and that any definition must include both objective factors (such as the existence of a shared ethnicity, language or religion) and subjective factors (including that individuals must identify themselves as members of a minority, UN 2010).

In the Indian context, from the sociological perspective, minorities are groups of people who do not enjoy a proportionate share of social, economic, or political power in a society. Although the Constitution of India does not define the term 'minority', it recognises the existence of minorities based on religion, language and culture and guarantees them certain rights and safeguards (Haque 2009). According to the Report of National Commission for Religious and Linguistic Minorities, 2007, two types of Minorities are recognised in India — Religious and Linguistic minorities. The Constitution of India does not define minorities. However, it uses the word 'Minorities' in Articles 29, 30, 350 (A) and 350 B. Article 29 has the word 'minorities' in its marginal heading and specifies that any section of citizens residing in the territory of India or any part thereof having a distinct language, script, or culture of its own shall have the right to conserve the same. Article 30 speaks specifically of two categories of minorities — religious and linguistic. The Articles 350 (A) and 350 (B) relate to linguistic Minorities only. At present the categories of religious Minorities include: Muslims, Christians, Sikhs, Buddhists, Parsis (Zoroastrian) and Jains. These communities are

notified by the Union Government under Section 2 (c) of the National Commission for Minorities Act, 1992. Jain community was also notified as minority community on January 27, 2014. As regards linguistic minorities, there is no majority at the national level and so the minority status is to be essentially decided at the State or Union Territory level.

According to the Census of India, 2011, the population of Muslims is 17.22 crore (14.23%), Christians 2.78 crore (2.30%), Sikhs 2.08 crore (1.72%), Buddhists 84.43 lakh (0.70%) data for Parsis (Zoroastrian) is not available in the Census. Out of the total literacy rate of India as per 2011 census which is 74.04%, the minorities literacy is — Muslims (68.5%); Christians (84.5%); Sikhs (75.4%); Buddhists (81.3%); and Jains (94.9%). The literacy rate for Zoroastrian (Parsis) is not available in the 2011 Census.

Minority in Odisha

Odisha being a state having composite communities occupies a distinct place in our country as it represents a unique blend of unity among various classes of socio-economic and cultural background. Out of the 30 districts, Gajapati and Bhadrak have been identified as Districts with a high population of minorities. The welfare of Minorities of Odisha comes under the SC and ST Development, Minorities and Backward classes welfare Department, Government of Odisha, wherein the concerned department takes care of the policies, programmes, regulation, etc., related to minority communities. As per 2001 census, minorities account for 5.64% of Odisha's population which includes — Christians (2.44%), Muslims (2.07%), Sikhs (0.05%), Jains (0.02%), and Buddhists (0.03%), respectively. As per the Census of India, (2011), Odisha has only 2% Muslim population but there was a gradual increase in number of madrasa to 217 and spread over the 15 districts of Odisha. As per the number of Muslim concentration, the number of madrasas differ in different districts. In fact, there are 167 madrasas spread across different districts of Odisha. Out of the total number of madrasas only one is fully government, situated at Jajpur district. Christian minority schools in the context of Odisha are basically under the religious jurisdiction and management of the Roman Catholic Archbishop, management Diocese of Church of North India, Baptist Mission Society, and Jeypore Evangelical Lutheran Church (JELC), etc. The institutions managed under the three denominations mentioned above are unique in its own way and they have a commendable contribution for the education of the state. At present, there are approximately 400 Christian-managed schools.

Administrative Set Up of the State for the Development of Minorities

(a) There is a Ministry for SC/ST and Minorities Welfare — A Separate

Department of Minorities and Backward Classes Welfare was set up in 1999

(b) Odisha ST and SC Development Finance Cooperative Corporation is the channelising agency for the National Minorities Development and Finance Corporation (NMDFC)

(c) State Backward Classes Commission set up in 1993

Other Institutional Set Up

(a) Minority Commission — No Minority Commission in the state

(b) Wakf Board/Wakf Tribunal/Haj Committee: All these Institutions have been set up by the State Government and Grants are also being released to them
(Source: http://www.minorityaffairs.gov.in/reports/annual-reports)

Need and Significance of the Study

Education is the basic input for sustainable development; especially in the context of socio-economic development particularly for the socially excluded groups. If groups are able to obtain high quality education, it is one of the clearest routes towards upward mobility and social acceptance. For this upward mobility, it is the most important to empower the weaker sections of the society. In spite of education being a fundamental right since almost a decade, there exists a wide gap in the benefit of education for all. The main concern in this regard continues to remain within the socially disadvantaged and minority communities. For instance, though the economic and social situation of Muslims is not the same throughout India, one cannot deny the fact that poverty and lack of genuine financial recourses are hampering socio-educational development of the community at every step (Qasmi 2005). Considering the diverse nature of the country, the spirit of aspiration is seen in the constitutional provisions, such as Article 29, 30, 347, 350 (A), etc., as a key move towards establishment of egalitarian society and state. In spite of these, there exists variation among the six (6) religious minorities in India (Muslim, Christian, Sikh, Buddhist, Parsi [Zoroastrian] and Jain) wherein Muslims continue to face maximum challenge. Statistics shows that Muslims are one of the most backward communities in the field of education and literacy in the country (Qasmi 2005). The status of minorities, particularly of madrasas at Odisha is the same in terms of educational challenges in spite of the programme and schemes implemented, such as Prime Minister 15 point programme, Quality Education in Madrasa (SPQEM) and the schemes of the National Minorities Development and Finance Corporation, etc. As the educational status of the minority community has been a persistent

cause of concern as minority deficits in education persist. There is a strong view emerging that reduction of the educational gap among certain minority groups which necessitate the challenging issues to be addressed by taking into considering all the dimensions of the schools. It is also important to understand the system of functioning and other academic activities of the school and the professional need of the teachers through research study. Thus, the present study has been designed to explore the challenges faced by minority schools in the context of Odisha in order to collaborate in the educational endeavor.

Objectives of the Study

(a) To study the educational challenges faced by madrasas and Christian minority schools at the elementary level in Odisha.

(i) Delimitation: The study was delimited to *madrasa* and Christian managed schools at five districts of Odisha and confined to 24 schools at the elementary level, i.e., 12 schools each from madrasas and Christian schools as given below (Table 1).

Table 1

Madrasas		Christian minority schools	
Cuttack	04	Khurda	04
Kendrapara	04	Cuttack	04
Jajpur	04	Koraput	04

Methodology of the Study

(a) Design: The descriptive survey type was used for the study.

(b) Tool: School information checklist, questionnaires, interview schedule for the teachers and head teachers, observation schedules for classroom and school processes were employed for collection of relevant information or data.

(c) Sample: Samples were selected purposively from the schools which comprised Principals, Teachers and Community members.

(d) Analysis and interpretation: The collected data were analysed descriptively using frequencies and percentages that are presented in Table 2. It is presented for both the minority educational set ups separately. The quantitative analysis is supplemented with qualitative data gathered through interview and observation.

Table 2
Infrastructural Facility

Facilities	Madrasas (N=12)			Christian minority schools (N=12)		
	Good	Manageable	Poor	Good	Manageable	Poor
Principals'/Head teachers' room	6 (50%)	3 (25%)	3 (25%)	8 (66.67%)	3 (25%)	1 (8.33%)

Teachers' common room	5 (41.67%)	4 (33.33%)	3 (25%)	7 (58.33%)	3 (25%)	2 (16.67%)
Office room	3 (25%)	4 (33.33%)	5 (41.67%)	7 (58.33%)	4 (33.33%)	1 (8.33%)
Classroom space	2 (16.67%)	5 (41.67%)	5 (41.67%)	3 (25%)	6 (50%)	2 (16.67%)
Sufficient furniture in classroom	2 (16.67%)	3 (25%)	7 (58.33%)	7 (58.33%)	4 (33.33%)	1 (8.33%)
Light and ventilation in classroom	2 (16.67%)	4 (33.33%)	6 (50%)	9 (75%)	3 (25%)	0 (0%)
Library	3 (25%)	3 (25%)	6 (50%)	6 (50%)	3 (25%)	3 (25%)
Sufficient reading materials in the library	1 (8.33%)	4 (33.33%)	7 (58.33%)	4 (33.33%)	4 (33.33%)	4 (33.33%)
Reading room	2 (16.67%)	3 (25%)	6 (50%)	2 (16.67%)	4 (33.33%)	6 (50%)
Functional toilet	5 (41.67%)	4 (33.33%)	3 (25%)	8 (66.67%)	2 (16.67%)	2 (16.67%)
Boundary wall	1 (8.33%)	3 (25%)	8 (66.67%)	5 (41.67%)	5 (41.67%)	2 (16.67%)
Playground	2 (16.67%)	3 (25%)	6 (50%)	6 (50%)	2 (16.67%)	4 (33.33%)
Provision of ramp and rail	0 (0%)	2 (16.67%)	10 (83.33%)	7 (58.33%)	3 (25%)	2 (16.67%)
Water facility	6 (50%)	4 (33.33%)	2 (16.67%)	8 (66.67%)	2 (16.67%)	2 (16.67%)
Electricity facility	9 (75%)	3 (25%)	0 (0%)	9 (75%)	3 (25%)	0 (0%)

While comparing the infrastructural facilities at the two set up, it is evident from the table above that Christian minority schools are at an advantage with better facilities, in all the areas assessed. This could be due to the better administration and connectivity or linkages within the management system. Moreover, it was found that, madrasas do not receive most of the facilities provided by government and they feel isolated and sidelined which directly and indirectly relate to the status of infrastructure.

Professional Need of Teachers

Table 3
Position of Teaching Head/Teachers

Type of school	Position of HM/ Principal	Position of trained teachers	Attended training/ orientation programme	Training needs of teachers in different areas
Madrasa	100%	30. 07%	60%	80.02%
Christian minority school	53.33%	46.05 %	70.01%	70.05%

The study indicates that, many teaching posts in different categories are lying vacant both in the madrasas and Christian schools. Only 53.33% of Christian schools have principals and only 46.05% trained graduate teachers are there, which affects teaching of different disciplines, particularly science and mathematics. Whereas Madrasas has principals or headmasters (100%), but teacher vacancy for different subjects at the elementary level are at a low with 35%. It is quite interesting to note that, many of the teachers are contractual in different schools for teaching different subjects particularly in the Christian schools.

As for teacher professional growth, in the madrasas 60% teachers have attended training or orientation programmes organised by SSA, DIETs and SCERT, but, 80.02% teachers opined that they need training on pedagogy, ICT and teaching children with special needs in a rigorous manner. As for the Christian minority schools, teacher training is being conducted by its management board or school authority on a regular basis. Around 70.0% of the teachers said that they have attended trainings provided by government agencies. However, 70.05 % teachers in the Christian minority schools also opined that they need a specific pedagogy training and management of inclusive classroom.

Classroom Transaction

The classroom observation is made based on the above six parameters of classroom process Table 4. The percentages indicate that they do not differ significantly and it range between 59.1 to 65.2%. Grand average is 61.17 for Christian minority schools, whereas in the madrasas the range is between 45.38 to 79.38%. There is a slight variation between the two set ups in terms of assessment of learners which is 61.17% (Madrasas), 61.77% (Christian schools), whereas a marked difference was observed in terms of inclusive classroom management, i.e., 45.38% (Madrasas) and 61.39% (Christian-managed schools). With regards to content management in the transaction process, madrasas

Table 4
Classroom Transaction

Parameters	Madrasas			Christian minority schools	
	Maximum dimension scores	Average obtained score (N=40)	Average obtained score in %	Average obtained score (N=40)	Average obtained score in %
Content knowledge of the teacher and its relevance	24	14.35	59.79	15.65	65.2
Organisation of content	21	13.22	62.95	12.57	59.85
Presentation of content	48	26.43	55.06	28.37	59.1
Teacher-student interaction	21	16.67	79.38	12.55	59.76
Assessment of learner	18	11.01	61.17	11.12	61.77
Inclusive classroom management	48	24.78	45.38	29.47	61.39

scored a higher percentage at 62.95% while Christian managed schools are at 59.85%. This may be due to the madrasa teachers' exposure to government agencies' teacher training programmes. However, it is found that the need for teacher's professional development is required at both the systems, which can be linked and supplemented to findings of teachers' opinion in the interview.

Social Climate in the Schools

Table 5 depicts the data based on observation and interaction with teachers and students.

Table 5
Social Climate

Parameters	Madrasas (N=12)		Christian schools (N=12)	
	Good	Poor	Good	Poor
Physical environment	3 (25%)	9 (75%)	6 (50%)	6 (50%)
Academic environment	10 (83.33%)	2 (16.67%)	7 (58.33%)	5 (41.67%)

Social environment	9 (75%)	3 (25%)	8 (66.67%)	4 (33.33%)
Interpersonal relationship	10 (83.33%)	2 (16.67%)	9 (75%)	3 (25%)

Social climate is conducive, both in the *Madrasa* and Christian schools, as indicated in the table above. Teachers are very concerned for students learning and maintain a good interpersonal relationship between head and teachers, teacher to teachers and students and teachers.

Findings and Discussion

(a) One of the major findings is that infrastructural facility is not up to the mark and needs upgradation or improvement. This also affects the academic aspects particularly at madrasas. Sharma and Pankaj (2008) in a baseline survey of minority concentration districts of India found that there exists an infrastructural deficit at the village level and school sector. Moreover, in the larger picture, the infrastructural issue can also be linked to Bhattacharya's (2015) findings, wherein villages with large Muslim population are located in states or areas with poor physical and social infrastructure.

(b) Classroom observation revealed that teachers do not have the latest pedagogical input to support students' learning. Lack of exposure to latest technology, no provision to be part of academic discussion and sharing with other institutes or organisations may be the main cause of resorting to traditional mode of teaching. This can also be linked to teachers' identity crisis due to the existence by itself as an island. This concern needs to be taken into cognizance by policy framers and other stakeholders of teacher education institutes.

(c) Need-based training in content and pedagogy areas, RTE Act, action research, teaching children with special needs, use of ICT in classroom, and guidance and counseling of students are not organised for the teachers. Similar challenges can be cited in a study of madrasas at UP and West Bengal by Nair (2008) who mentioned that, the number of teachers sanctioned was found to be inadequate and the school Head were insufficiently equipped to supervise the additional subjects; nor were the teachers adequate in professional capacity.

(d) Teachers assessed student performance in a more or less traditional way using oral and written tests and giving assignments. There is a need to orient teachers to use multiple methods of evaluation as per the guidelines of CCE.

Recommendations and Conclusion

The study clearly shows that madrasas are at a greater disadvantage with reference to the infrastructure which calls for immediate attention from the authorities. Given the fact that minority institutions getting support to improve quality, the beginning has to be made with infrastructure.

Both in the Christian and *madrasa* schools' professional development is totally neglected and teachers are in identity crisis. The in-service teacher development programmes of the state have to include teachers from the minority institutions in a phased manner and carry out follow up, which will develop confidence among the teachers. They must be motivated to undertake developmental work, project work, adopt a new methodology of teaching and work as a resource teacher during training programmes. The teacher must be supported to utilise the training inputs received in the training programme for qualitative improvement of education.

Limited association of minority schools with other educational institutions in the locality and larger community is observed. Madrasa, despite being the focus of attention and concern, continue to function in relative isolation, doing little to alleviate the poverty of the ordinary Muslims in the state (Aleaz 2005). There are some common problems shared by the Muslim population all over India in terms of pervasive and lingering sense of insecurity, apprehension of communal riots, marginalisation and threat to religious and cultural identity (Momin 2004). Collaboration with the local, district, state and national level institutions for academic activities and interaction with the immediate community for social events would quickly heal the isolation that in turn gives a positive direction to the journey towards inclusion.

There is lack of effective machinery to look into widespread negligence and indifferent treatment towards education of the minorities, especially Muslims. The important grievances of religious minorities relate, perhaps to the operation of the state agencies of the law and order, welfare, education and health, public services, state contracts, credits, licenses, and the judiciary (Akhtar and Nadir 2009). In this regard minority programmes and schemes like PM's 15 point programme and SPQEM are worth mentioning towards bringing change in the much neglected sector of society for education. To reap the 'demographic dividend', Indian policymakers and administrators will have to proactively implement at least existing social welfare programmes, particularly those that are related to school education (Sanghi and Srija 2014).

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Evolving Role of Special Schools for Children with Visual Impairment in India

Pankaj Kumar*

Abstract

Schools are the place where children and adolescents spend a significant time of their young lives. Student well-being is essentially influenced by the school. Special schools are believed to be an institute specifically dedicated to improving the lives of children and adolescents with disabilities; schools for the visually impaired are one of the forms of special schools. In India special schools for the visually impaired have significantly grown in number after independence. The nature of these schools varies as there are several innovative models of special education being practiced across the country. In the context of the recent development like the Right of Persons with Disabilities Act, 2016, and the Right of Children to Free and Compulsory Education Act, 2009, and Amendment 2012, one needs to look at special schools and inclusive schools as a dichotonomous continuum for education of all children with disabilities, exercising their right to appropriate education. Special schools will continue to have a significant role to play for inclusion of children with visual impairment. This paper explores the role and importance of special schools for the children with blindness and low vision in the country in the present context.

Introduction

A recent report on disability by United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) reveals prevalence of 2.2% persons with disability in India. Further, 18.8% of the total population of persons with disabilities include visually disabled (United Nations 2016, p. 148). Presently, more than

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5 million people in India are visually disabled (Census of India 2011; United Nations 2016, p. 148). Amongst all other countries of the world, India has the largest number of blind people (Sinha 2007). This paper explores the role and importance of special schools for the blind in the country in the present context.

The Right of Children to Free and Compulsory Education Act, 2009 (RTE Act) enforces to provide free and compulsory education for all children of the nation (Government of India 2009). Amendments in this act in year 2012 stress upon inclusion of children with visual impairment (low vision and blindness) along with other disabilities as included in the Persons with Disabilities Act, 1995 and the National Trust Act, 2000 (Government of India 2012, Government of India 1996, Government of India 2000). Inclusion is not about placing all children with special educational needs in mainstream schools (MacBeath et al. 2002, p. 11). Special schools are also a part of inclusion plan (Linton 2015, p. 12). Providing option for home-based education for children with severe disabilities was also added in the amendment in 2012 (Government of India 2012). Section 31(1) of the Rights of Persons with Disabilities Act, 2016, equip every child with benchmark disability between the age of 6–18 years to have the right to free education in a neighbourhood inclusive school, or in a special school, of his or her choice" (Government of India 2016, p. 13). On the neighbourhood criteria, the Delhi High Court ordered that a student's educational fate cannot be relegated to only his or her position on a map, whereas they have a fundamental right under Article 19(1)(a) of the Constitution to be considered for admission in a school of their choice (Jain 2017, Government of India 2015).

School is an important place in the context of learning, development and success in life. It is a place where children and adolescents spend a significant time of their young lives (World Health Organisation 2007, p. 7). A student's well-being is essential for both academic and social development (Australian Government 2016). Schools optimise this by providing supportive and respectful learning environments. Schools also act as an agent to share these responsibilities with the whole community. Prevalence of children with disabilities is 1.5% among 59 years age group and 1.8% among 1019 year (United Nations 2016, p. 148). The Eighth All India Education Survey reveals an increase of 17.36% in students with visual impairment in the country (NCERT 2016, p. 38). The education of children with visual disabilities needs an obvious attention. Vision is the primary learning modality and source of information for most children (TSBVI 1995). Students with visual impairments have unique educational needs. In order to meet their unique needs, students must be

provided special services (AFB 2000). Their educational needs are fulfilled by the two systems of school services: a) special schools; and b) schools with inclusive setting.

Special Schools: Wider Perspectives

Special schools for persons with disabilities are institutes dedicated to improving the lives of children and adolescents with disabilities. Most special schools are specifically designed, staffed and resourced to provide the appropriate special education for children with additional needs. Special schools also focus on providing individualised education, and addressing specific needs of students. A special school could be defined as a school for children who have some kind of serious physical or mental problem (Collins 2016). It is a school for children who are unable to benefit from ordinary schooling because they have learning or physical disabilities (Collins 2016). Generally, students attending special schools do not attend any classes in mainstream schools (Heward 2014). *Cambridge Advanced Learner's Dictionary and Thesaurus* (2016) also defines special school as a school for children who have physical difficulties or problems with learning.

Schools for the blind or visually impaired are one of the category of special schools. These special schools mainly cater the educational needs of children with visual impairment. Special schools for children with visually impaired in India usually offers residential facilities. Tuttle (1986) confirms special residential schools as the most comprehensive and the most expensive delivery model (as cited in Brown, Baine and Neufeldt 1996, p. 185). These centres focus on almost all arenas of the children with visual impairment including social, vocational and personal care strategies. We can also say by general public opinion that special schools denote a residential school. Frampton and Kerney (1953) defines residential school for the visually impaired as a boarding school offering education and care to blind children from ages 3–21, or from pre-school through the high school. Educationally speaking, these schools attempt to provide complete education and care for the blind children. These services include medical, academic, musical, social, vocational courses, placement, and follow-up (as cited in Punani and Rawal 2000, p. 240). The entire campus of the residential school is designed, equipped and staffed specifically to meet the needs of the visually impaired children. In addition to the classroom teachers, there may be other specialists in physical education, orientation and mobility, activities of daily living, music, craft teaching, occupational therapy, career counselling, vocational counselling, social work and psychology. The educational materials, educational and mobility devices and specialised equipment are accessible to all the students throughout the campus.

However, the residential school for the blind has undergone a decisive change in character.

Special schools are no longer an institution which children enter with an expectation that they will remain there until graduation, returning to the regular world only for vacation. Rather, it is a part of the stream into which it channels the pupils who have adjusted, and from which it receives those who need special training or temporary adjustment (Punani and Rawal 2000, p. 240). The residential special school system was never intended to separate, isolate or stigmatise visually impaired students from the society (Farrell 2007). Frampton and Kerney (1953) emphasise that the residential school has outlasted many social, educational, and economic changes and survives today, rigorous and alert, to its task. It will remain an important setting for fostering inclusion in the future by insuring the most productive and practical method of teaching. Mainstream schools are simply unprepared to educate children with blindness or severe visual disabilities and were found to be somewhat ignorant about their potential (Farrell 2007).

Special Schools: Emerging Roles

The presence of special schools in a parallel stream does effect the enrolment of children with disabilities in regular schools (NCERT 2006). Allan and Brown (2001) revealed that students' account of their special school experience appear to suggest a much broader notion of inclusion (p. 206). The students' experiences were characterised by achievements, progress and independence, rather than isolation and oppression. Special schools need to be brought into the inclusion debate. Since the children are taught by a specialist having expertise on specific impairments, their needs may sometimes be understood better. In special schools children grow up with their disability peers and develop a common culture. Special school remains a viable option, if a child with disability is not getting the required resource support in the mainstream school (Julka 2005). Semmel et al. (1991) concluded after surveying elementary school teachers (from both general and special schools), that they were not supportive of placing special students in mainstream schools (as cited in Wang 2009).

The recent debates about the inclusion of children with special needs have mainly focused on mainstream schools. Special schools have often been ignored, whereas the debates on inclusion must take account of the contributions of special schools (Allan and Brown 2001). It is not helpful to think these two systems in terms of a dichotomy. Whereas both of the services are essential for the continuum of individual educational need among all pupils (Beveridge 1999). Special schools continue to have a significant role to play (Beveridge 1999). Recognising

that the regular classroom may not be suitable for every disabled student, the options on this continuum include instruction in special schools (AFB 2000). A special school provides services that address the full range of the blind or visually impaired student's disability-specific needs, including those arising from other additional disabilities (AFB 2000). The special schools can play an active role in giving resource support for the mainstream schools by providing specialised services. The roles of special schools is to emphasise the need for planned interaction between special and mainstream schools (Beveridge 1999).

Special Schools and Inclusion

The historical context outlines that there has been a springing up of special schools over time along with provisions for integrated education (Julka 2005). Special schools were started as a separate system of education for children with visual disabilities, when the first special school for the blind was established in 1887 at Amritsar by Miss Annie Sharp (Punani and Rawal 2000, Julka 2005). These special schools are generally organised according to different disability specific categories.

There has not only been an increase in numbers or figures, but special schools have also evolved with new roles. Models of disability are a useful framework in which to gain an understanding of disability issues, and also of the perspective held by those creating and applying the models. These models provide an insight into the attitudes, conceptions and prejudices of society and give an idea of the current trends being developed for people with disability. Special schools started in initial years were based on 'charity approach'. Whereas, presently special schools are working on 'rights-based approach', disability has been understood differently. Formal education of visually impaired started with residential special schools and their importance has been still proved by various researches and policies. This requires looking into the students' lives beyond the locus of the school, finding ways of equipping them as responsible and independent learners and perhaps becoming less preoccupied with the physical location of where (special or inclusive) provision is made (Allan and Brown 2001, p. 206).

The purpose of special school provision has lacked clarity in government policies in the past. However, several policies including the Persons with Disabilities Act, 1995, promoted the setting up of special schools in the government and private sector for those in need of special education (Government of India 1996). Persons with Disabilities Act, 1995, also stressed over equipping "the special schools for children with disabilities with vocational training facilities" (Government of India 1996). There is also confusion about the extent to which vocational, functional

and life skills should be a part of the curriculum in such schools (Sebba, Thurlow and Goertz 2000, p. 114). Responsible agencies saw a continuing role for special schools and intended to adopt a 'practical, not dogmatic' approach to inclusion (Dyson and Millward 2000, p. 176). Programme of Action, 1992 already stressed the importance of special schools when recommended integrated education. It suggested special schools as a system to make students ready for general schools (MHRD 1992, p. 117). Sarva Shiksha Abhiyan (SSA) also has a provision to support special schools. Alternative roles for special schools were endorsed by the Salamanca Statement (1994). Hence, special schools in their new found identity would become a far more flexible resource, by working in partnership with and creating a response to special needs.

SRI-IMRB survey 2014, reported that the out of school children among the disabled population is much higher (SRI-IMRB 2014). Disaggregation reveals that a higher percentage of out of school children are in the rural areas (UNICEF 2014). Despite the fact that majority of India's total population lives in rural areas, facilities of special schools are more in urban areas. Hence, the role of special schools needs to be redefined in the Indian context. Special and general education, in other words, needs to move a significant step closer together. At no place this survey refers to children with Disabilities studying in special schools. This raises a serious concern about the right to education of these children and the way the provisions of the Right to Education 2009 are being monitored (Mukhopadhyay 2016). This also raise a question, will these special schools be considered as schools as per Right of Children to Free and Compulsory Education Act, 2009. Special schools need to be seen as a continuum of education and not as a welfare initiative (Mukhopadhyay 2017).

Special Schools for the Visually Impaired in India

The onset of the twentieth century in India witnessed the emergence of avoluntary sector providing rehabilitation services for the disabled population (Narasimhan and Mukherjee 1986). From 1887 to 2017 many organisations have evolved to offer school education services to students with visual impairment. Offering services do not mean that the organisation is a well-equipped school. So, operational definitions for different level of special schools are the need of the hour.

A comprehensive directory of special school services is needed for practitioners, special educators, teachers and parents. As parents are usually not much aware of the services and location of special schools, therefore, it becomes more meaningful for them. There is a lack of comprehensive source of information for parents of children

with disabilities in India (Planning Commission 2002). Poor parental awareness has also been reported by special schools' authorities regarding services that need to be provided to their visually impaired ward.

In 1947, India had a total of 32 schools for the blind (NCERT 2006). Narasimhan and Mukherjee (1986) reported total 126 special schools for the visually impaired out of the total 516 special schools across the country (p. 124). In 1989, the National Institute for the Visually Handicapped, Dehradun (NIVH) conducted a project on collecting data from schools for the blind or visually impaired across the country and shaping them to form a directory. Total 190 special schools for the visually impaired students were reported by this directory (NIVH 1989). In 2005, total 205 special schools for the blind and visually impaired were reported by a research study (Kain 2011). Special schools for the blind were also listed by Institute of the Physically Handicapped, New Delhi and Webel Mediatronics (Webel Mediatronics, n.d.). The number of institutions offering school services for the students with visual impairment rose to around 435 in 2016 as reported by the online directory (NIVH 2016). The online directory also reported a total of 1,061 organisations offering services for the blind and visually impaired across the country (NIVH 2016). The detailed sate-wise numbers of schools are as given below in Table 1.

Table 1
State-wise number of blind schools in India from various sources

S.No.	State	1986	1989	2005	2015
	Source ®	Narasimhan and Mukherjee	NIVH Directory	Kain, 2011	NIVH Online Directory
1.	Andhra Pradesh	8	12	12	15
2.	Arunachal Pradesh	-	*	-	00
3.	Assam	3	*	-	06
4.	Bihar	2	12	12	07
5.	Chhattisgarh	#	#	06	09
6.	Goa	##	*	-	01
7.	Gujarat	17	20	22	45
8.	Haryana	4	04	04	05
9.	Himachal Pradesh	-	01	01	02
10.	Jammu and Kashmir	-	02	01	02
11.	Jharkhand	#	#	05	05

12.	Karnataka	12	07	07	09
13.	Kerala	10	11	10	13
14.	Madhya Pradesh	02	18	12	37
15.	Maharashtra	22	29	29	65
16.	Manipur	01	01	01	05
17.	Meghalaya	-	*	-	02
18.	Mizoram	01	01	01	03
19.	Nagaland	01	01	01	00
20.	Odisha	02	08	10	43
21.	Punjab	01	06	06	16
22.	Rajasthan	06	06	07	21
23.	Sikkim	-	*	-	00
24.	Tamil Nadu	10	20	22	29
25.	Telangana	#	#	#	#
26.	Tripura	-	01	01	02
27.	Uttar Pradesh	05	12	08	35
28.	Uttarakhand	#	#	04	04
29.	West Bengal	07	10	11	31
30.	Andaman and Nicobar Islands	-	*	-	00
31.	Chandigarh	01	01	01	03
32.	Dadra and Nagar Haveli	-	*	-	00
33.	Daman and Diu	-	*	-	00
34.	Delhi	11	06	08	19
35.	Lakshadweep	-	*	-	00
36.	Pondicherry	-	01	01	01
	TOTAL	**126**	**190**	**205**	**435**

#State was not in existence at the time of data collection
**Data not available*

It is evident from Table 1 that the number of special schools has increased in the country even after a strong move by the government to integrate them in mainstream schools by various schemes. The increase in special schools has also stressed establishment of norms and standards as well extensive database of these schools; which is lacking

presently. Special schools must adhere to all policy requirements and legislation. All national and provincial requirements also apply to special schools unless otherwise indicated (Republic of South Africa 2007, p. 5). Norms or indicators on quality parameters of special schools may enhance the functionality and services across the country. Database or directory of school or services for the visually impaired helps every stakeholder attached with the education of children with visually impaired. The concerned department of education must keep comprehensive records of all special schools (Republic of South Africa 2007, p. 5). A good directory must have presentation of data in different formats. The evolution in communication technologies replaces the paper-based directory. Instead an online directory is more helpful for accessing data related to schools and also sorting in desired formats at certain extent. For the same it is necessary or desirable that data has been captured with certain principle of making better directory. It is also a pre-requisite for the directory that terms should be well defined operationally to avoid any vagueness. The difference in resource centre and special schools also need to be defined in policy documents.

Conclusion

As per the present scenario, special schools show themselves as a crucial factor for all round development of the children with visual impairment. However, there are some disadvantages like children usually have to leave their families and communities to stay in a residential setting because these schools are usually not available in their immediate environment. Due to staying away for long in a separate environment, away from their families, they may find it hard to readjust to their families, peers and communities. But, now special schools have evolved as a new right-based setting for education and developing life skills, instead of merely being an institution for charity. These schools must be seen as integral part of inclusive education.

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Determinants of School Dropout Rates Across the Districts of Telangana and Andhra Pradesh States

An Econometric Study

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Abstract

Despite sizeable spending by the State on education at school level, millions of students in the age group of 6 to 13 are found out of school because of high dropout rates. Many studies found different factors responsible for this, such as literacy and poverty levels of parents, availability of adequate infrastructure facilities in schools, pupil-teacher ratio, trained teachers, distance and accessibility of school, etc. This study attempts to identify the important factors which determine the school dropout rate by using linear multiple regression method on cross section data of Telangana and Andhra Pradesh (the combined Andhra Pradesh) for the year 2013–14. For the purpose of formulation of appropriate policy, the determinants are identified in an order of their degree of influence. Prevailing literacy levels, percentage of rural population and pupil-teacher ratio in the district are found to be significant factors.

Introduction

Having realised the strategic importance of universal education for sustained economic development in late 1990s, the Government of India formulated and implemented different policies to achieve this objective which culminated into the

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enactment of Right of Children to Free and Compulsory Education Act, 2009 to all children between 6 to 14 years of age. Primary education should reach the millions of masses living in rural areas to ensure sustainable development. The enrolment ratio being far away from the set targets, the dropout rates have become serious impediments in the achievement of the objective of 'education for all'. A 2016 report by Montreal-based UNESCO Institute for Statistics and Global Education Monitoring says that 47 million students dropped out of school by the Class X [1].

As per the 2014 survey by the Ministry of Human Resource Development, Government of India [2], the gross enrolment ratio (GER: student enrolment as a proportion of the corresponding eligible age group in a given year) has increased at almost every level of education in India indicating that the educational system has become more accessible. Upper primary and secondary schools' GERs saw a rise of 13 per cent and 17 per cent, respectively, in 2013–14 compared to 2007–08. Despite this increase, six million children aged between 6 and 13 are estimated to be still out of the school system.

This article makes an attempt to examine the various causes of school dropout rates at different levels of age groups among scheduled castes, scheduled tribes and other categories of students with the help of multiple regression technique applied for district-wise secondary data of two Telugu states (Combined State of Andhra Pradesh).

School Dropout Rate: The Conceptual Definition

School dropout rate is the proportion of students who leave school during the year as well as those who complete the grade level but fail to enroll in the next grade level the following school year to the total number of students enrolled during the previous school year (Table 1). It reflects the obstacles for a social group to complete a specific level of education.

Table1
Dropout Rates of All Categories of Students from 2001–02 to 2013–14

Year	Primary Level (IV)			Elementary Level (IVIII)			Secondary Level (IX)		
	Boys	***Girls***	***Total***	***Boys***	***Girls***	***Total***	***Boys***	***Girls***	***Total***
2001–02	35.36%	33.64%	34.54%	51.98%	55.77%	53.78%	71.62%	73.28%	72.37%
2002–03	33.74%	30.19%	32.39%	49.93%	53.22%	51.52%	67.46%	71.02%	69.12%
2003–04	42.42%	42.80%	42.61%	52.71%	55.92%	54.27%	65.08%	68.53%	66.70%
2004–05	31.77%	32.14%	31.95%	51.96%	54.46%	53.17%	62.30%	65.24%	63.69%
2005–06	24.61%	24.85%	24.73%	50.26%	52.37%	51.30%	62.24%	65.20%	63.67%
2006–07	26.76%	27.32%	2704%	42.14%	44.32%	43.22%	62.99%	65.33%	64.13%

2007–08	19.10%	18.48%	18.79%	33.26%	35.23%	34.24%	62.30%	64.00%	63.13%
2008–09	16.14%	15.15%	15.65%	34.39%	35.41%	34.89%	60.12%	61.38%	60.73%
2009–10	16.34%	15.24%	15.80%	26.38%	26.50%	26.44%	52.73%	54.02%	53.36%
2010–11	18.10%	16.73%	17.43%	22.56%	22.11%	22.34%	45.83%	46.59%	46.21%
2011–12	15.92%	15.27%	15.60%	21.51%	20.06%	20.79%	45.43%	45.99%	45.71%
2012–13	15.13%	15.45%	15.29%	27.14%	25.81%	26.48%	37.83%	37.80%	37.82%
2013–14	12.88%	12.60%	12.74%	26.56%	25.12%	25.85%	32.80%	32.47%	32.64%

Source: Educational Statistics of United Andhra Pradesh – Published by Commissioner and Director of School Education, Hyderabad, A.P. 2013–14, p. 89

Despite many programmes being initiated by the central and state governments for the improvement in the overall enrolment, heavy school dropout rates persisted resulting in wastage of public resources. As the figures in Table 1 show, the total dropout rate was 72% in 2001–02 and it has decreased to 32% by 2013–14. Although the dropout rate reduced significantly it was not closer to what was to be achieved. Inefficiency of education system and social disorganisation are the reasons for this. Other factors, such as family income level, low parental attitude towards learning, their educational level, unsuccessful migration, interest of children and unfavourable peer group influence on the academic achievement of students also contributed for high dropout rates. In the following section a brief review of some of the relevant research works is presented.

Review of Literature

A good number of research studies have been conducted in this area seeking to explain the factors responsible for high school dropout rates in India. In the following section some of the research works relevant for the present study are reviewed.

In a study conducted in Kerala, Pillai, Banjamin and Nair (1980) [3] find ill health, household work and poverty as main reasons for dropouts in primary education in Kerala. They also include large size of the family and lack of education being influential factors for dropouts. They also find that it was higher among boys than girls.

Shrivastava and Gupta (1980) [4] found in the survey of the dropout children, in the age group of 6–14 years in Ferozpur District in Punjab, that the number of dropout was high in rural areas than in urban areas; educational background of the parents was very poor which influenced the dropouts. Parents of dropouts were economically backward, the parents felt the need of child to work at home, unsympathetic teachers, dull curriculum, lack of utility of education, lack of interest in education and textbooks, lack of separate schools for girls and narrow

outlook of parents were some of the main reasons for dropout.

In a case study conducted in the Warangal district of erstwhile Andhra Pradesh, A. A. Acharya (1984) [5] found that "Mid-Day-Meal" (MDM) Scheme became a boon to the poor pupils and it also helped to a considerable extent in the increase of enrolment of students from the economically weaker section.

Rajaiah, B. (1987) [6] studied primary education in the state of Andhra Pradesh and concluded that the primary education development was very poor. An alarming dropout rate in Class I was found to be a serious constraint for achieving universalisation of primary education.

Rajan and Jaykumar (1992) [7] had conducted a study in 17 schools of Nagercoil Educational district of Kanyakumari in which they showed the impact of 'Chief Ministers Nutritious Noon-meal programme' (CMNNMP) or the 'Midday Meal' (MDM) on enrolment, attendance pattern and dropout rates of the primary school students. They compared the annual growth rates in these indicators before (1979–82) and after (1983–89) the starting of the programme. The result of their study clearly indicated that this programme raised the attendance and reduced the dropout rates among the students.

Mishra and Behera (2000) [8] have made a comparative study on the impact of 'Mid-Day-Meals' (MDM) Scheme in Odisha and Tamil Nadu states. And they found that the scheme has a tremendous impact on attending schools regularly among the primary-level tribal and other students in both the states. Similarly, this scheme has reduced the dropout rate of the target groups in the sample states.

In a study conducted on the basis of the unit level 64th round NSS data (2007–08), Sikdar and Mukherjee (2012) [9] listed out 20 reasons that contribute to school dropouts and they divided them into eight categories: (i) household atmosphere (parents not interested, no tradition in the community and education not considered necessary), (ii) access and infrastructure of school (inadequate number of teachers, school is far away, timing of educational institute is not suitable, unfriendly atmosphere in school, non-availability of lady teachers and non-availability of ladies' toilets, (iii) alternative source of work (to work for wage and salary and for participating in other economic activities and for helping in household work), (iv) household duties (look after younger siblings and to attend to other domestic chores), (v) financial constraints, (vi) quality of education (language or medium of instruction used unfamiliar, child not interested in studies and unable to cope or failure in studies), (vii) completed desired level/class, and (viii) other reasons.

School circumstances also play an important role in the dropout decision of children. Among others, student-teacher ratio is an

important determinant of the dropout phenomenon. Russell W. Rumberger and S. L. Thomas [10] in 2000 found that public, urban, and large schools and those with higher student–teacher ratios tended to have higher dropout rates.

Methodology

(a) Objectives and Data Source: Since the primary objective of this study is to provide quantitative estimates — the algebraic sign and numerical value — of some important determining factors of school dropout rates, this study is based on the secondary data sources — Educational statistics 2013–14 published by Commissioner and Director of School Education, Andhra Pradesh/Telangana, Hyderabad and NSSO 68th Round Survey on Consumer Expenditure for the year 2011–12. The model of data analysis is a linear multiple regression, i.e., the dependent variable 'school dropout rate' is regressed on some selected independent variables to measure the nature and strength of relationship between school dropout rate and the chosen explanatory variables. Another related important question in this regard is which variable is most important? The linear regression model yields estimates based on the measurement units of the included variables. To answer the question which variables are relatively important we cannot compare the numeric values of the estimates of the unstandardised variables. To know the relative influence of the different explanatory variables on the dropout rate, we need standardised estimates which are estimates of the standardised variables. Very often for a given variable X its standardised variable is computed as Z = (XmX)/sdX where mX is mean of X and sdX is standard deviation of X.

The following section presents the details related to data sources, model used, variables included and a priori algebraic signs of the parameters.

(b) The Estimated Model: A linear multiple regression model is used to estimate the relative influences of the chosen explanatory variables on school dropout rates.

DROPOUT_RATE = bo + b1* PERCENT_RURALPOP + b2 *LITERACY_RATE + b3 * PUPIL_ TEACHER_RATIO + b4 * GER + b5 * MPCE + e

This model is estimated separately for three levels of education (Class I–V, Class I–VIII and Class I–X) and for three social categories (Others, SC and ST) producing nine sets of results.

(i) DROPOUT_RATE (Dependent Variable School Dropout Rate): It is expressed as a percentage of students who have dropped out of the total students enrolled for the given

academic year. The working formula is as follows: No. of students in Class I in 2009– No. of students in Class V in 2014.

For instance the dropout rate for the year 2009

$$= \frac{\text{No. of students in Class I in 2014} - \text{No. of students in Class V in 2014}}{\text{No. of students in Class I in 2009}}$$

Similar formulas are used for other levels of education and social categories, i.e., Class I–V, Class I–VIII and Class I–X; 'Others', SC and ST categories.

(ii) PERCENT_RURALPOP (Percentage of Rural Population): This is included in the model as an explanatory variable since many of the research studies found it to be influencing the dropout rate because of the lack of all-weather approach roads to the schools, low-level awareness and perception of parents in rural areas for the need for education of their children, etc. Hence, its coefficient b1 is expected to be positive (b1>0).

(iii) LITERACY_RATE (Literacy Rate): It is quite logical that a high literacy rate implies higher levels of education of parents and their awareness about its importance. Hence, literacy rate in a chosen geographical unit is expected to influence the dropout rate negatively in that region. Therefore, its coefficient b2 is expected to be negative (b2<0).

(iv) PUPIL_TEACHER_RATIO (Pupil-teacher Ratio): One of the important factors responsible for retaining the student in the school is the adequate number of teachers, i.e., desirable pupil-teacher ratio. If more teachers are available, the dropout rate is expected to be low. Hence, the coefficient of this variable is expected to be negative (b3<0).

(v) GER (Gross Enrolment Ratio): It is defined as the number of students enrolled in a specific school level as a percentage of eligible children as per the official school age in that level. It is observed that a higher GER is normally associated with falling dropout rates. Hence, its coefficient b4 is expected to be negative (b4<0).

(vi) MPCE: (Monthly Per Capita Consumption Expenditure): It is an index of general economic status of the parent. A higher MPCE implies a high capacity of the parent to bear with the cost of the child's education as well as capacity to bear the loss of potential family income if the child also works. Therefore, its coefficient b5 is expected to be negative indicating that the dropout rate will be low for higher levels of MPCE (b5<0).

(c) Hypotheses

The a priori economic theory stipulates the algebraic signs for the coefficients of the explanatory variables. Hence, the following null and alternative hypotheses are formulated:

H0: (b1=0), (b2=0), (b3=0), (b4=0), (b5=0)

H1: (b1>0), (b2<0), (b3<0), (b4<0), (b5<0)

Therefore, one-tailed hypothesis testing is used and the test results are presented along with the corresponding level of significance with standard error and student's t-test.

The functional association between dependent variable and the independent variables is sought to be explained with the help of their correlation coefficients.

The average of all the variables in the three social categories and three levels of education are put together into a table for the purpose of comparisons.

The estimated regression coefficients — unstandardised and standardised — of the explanatory variables are presented along with their standard errors and the corresponding t-values separately for social category and school level as well as a consolidated table for all.

The overall goodness of fit of the model is judged on the basis of R2 and Analysis of Variance with F-test.

The statistical reliability of the estimates of multiple linear regression is judged on the basis of second order econometric tests, such as multicolinearity, heteroskedasticity and auto correlation. The traditional test for multicolinearity is inspecting the numerical value of the correlation coefficient between any two independent variables. If it exceeds 0.8 then it is understood that there is a strong correlation between explanatory variables rendering the OLS estimates as 'indeterminate'.

The problem of heteroskedaticity occurs when some of the important explanatory variables are omitted by the model. In such a situation the error term is strongly correlated with the explanatory variable causing the OLS estimates to be biased and their variances being not minimum. The easiest way of testing this problem is to plot the residuals and see if their distribution is normal.

The computer generated SPSS output of the estimated sets of results are presented in Appendix I and interpreted in the following section. The error term variation graphs are presented in Appendix II.

Results, Analysis and Discussion

As stated earlier, multiple linear regression is estimated for nine models, i.e., three school levels and three social categories. The regression results of these nine models are separately presented in tables numbered from 4 to 12. The means of dependent and independent variables of all the nine models or sets are presented in Table 2. Further, the unstandardised and standardised regression estimates or coefficients of the nine sets are presented in Tables 3a and 3b. These tables provide us an easy comparative understanding of the difference of the means and coefficients among three school levels and three social categories.

As the figures in Table 2 indicate, there is a striking pattern of dropout rates among social categories in all the school levels. From the accumulated school level of 1 to 10, the dropout rate in 'Others' category is 26.32 per cent in percentage, in SC category 35.36 per cent and in ST category it is more than double of the others category at 59.05. Thus one of the important findings from this study is that school dropout rates are highest among ST community followed by SC and Others.

Table 2
Category-wise Average of Dropout Rate and Other Explanatory Variables (in percentage)

Variable	Level I to V			Level I to VIII			Level I to X		
	Others	***SC***	***ST***	***Others***	***SC***	***ST***	***Others***	***SC***	***ST***
Dropout_rate	7.91	11.51	25.65	18.38	27.31	47.65	26.32	35.36	59.05
Percent_ruralpop	68.24	68.24	68.24	68.24	68.24	68.24	68.24	68.24	68.24
Literacy_rate	66.29	62.16	50.90	66.29	62.16	50.90	66.29	62.16	50.90
Pupil_teacher_ratio	26.91	26.91	26.91	22.91	22.91	22.91	43.22	43.22	43.22
GER	93.73	111.61	120.96	94.16	101.35	106.98	88.57	95.89	96.69
MPCE	1522.99	1522.99	1522.99	1522.99	1522.99	1522.99	1522.99	1522.99	1522.99

Table 3(a)
Consolidated Statement of Unstandardised Regression Coefficients

Variable	Level I to V			Level I to VIII			Level I to X		
	Others	***SC***	***ST***	***Others***	***SC***	***ST***	***Others***	***SC***	***ST***
Percent_ruralpop	.083	.048	.370	-.337	.256	.019	-.104	.114	-.095

Literacy_rate	-1.368	-1.139	-1.870	-2.445	-.712	-2.447	-1.738	-.954	-1.979
Pupil_teacher_ ratio	1.042	-.355	1.843	.707	.220	.407	-.059	-.113	.026
Ger	.664	.162	.065	.109	.328	.122	.730	.237	.106
Mpce	.007	.008	.015	.015	.008	.015	.010	.008	.013

Table 3(b)
Consolidated Statement of Standardised Regression Coefficients

Variable	**Level I to V**			**Level I to VIII**			**Level I to X**		
	Others	***SC***	***ST***	***Others***	***SC***	***ST***	***Others***	***SC***	***ST***
Percent_ruralpop	.131	.093	.461	-.471	.507	.025	-.121	.209	-.151
Literacy_rate	-.737	-.796	-.746	-1.161	-.513	-1.022	-.685	-.635	-1.003
Pupil_teacher_ratio	.336	-.139	.468	.188	.083	.101	-.042	-.127	.026
Ger	.459	.389	.170	.102	.688	.226	.454	.416	.212
Mpce	.242	.303	.399	.434	.316	.411	.246	.291	.422

Table 3a presents the unstandardised regression coefficients of all the nine sets while Table 3b consists of corresponding standardised regression coefficients of the nine data sets. It is important to first examine the sign, magnitude and the statistical reliability of these coefficients. These are found in Tables 4 to 12 for the said nine sets.

Tables 4, 5 and 6 (Appendix–I) present the regression results for three social categories in school level for Class I–V.

Table 4a (Appendix–I) presents the averages of the variables and 4b (Appendix –I)presents the correlation coefficients between each and other variables. The correlation coefficient between dropout rate and its explanatory variables indicate the nature and strength of the relationship. The correlation coefficient among the explanatory variables must be examined for the existence of multicolinearity problem. In this data set no value is exceeding 0.8 and hence there is no multi colinearity. Table 4c (Appendix–I) presents the model summary, i.e., R, R2, and adjusted R2 which indicate the overall fitness of the model. In other words it is the explanatory power of the estimated model. In this case the values are 0.757, 0.572 and 0.447 which are very satisfactory.

Table 4d contains the Analysis of Variance Summary giving the ratio of regression variation and residual variation and thereby computing the F ratio which is 4.553, significant at 0.008 which implies the high degree of goodness of fit of this model.

Table 4e (Appendix–I) presents the unstandardised and standardised regression coefficients and their

standard errors, *t* values and their significance levels. As per the priori criteria the algebraic signs of these coefficients are (b1>0), (b2<0), (b3<0), (b4<0), (b5<0). Out of the five regressors, percentage of rural population and literacy rate coefficients are in accordance with priori signs. To examine the relative importance of the regressors on the dropout rate, the standardised coefficients are used. As Table 4e shows the highest value of the coefficient is for literacy rate followed by GER and pupil- teacher ratio.

Table 5 presents the regression results of the data set relating to 'SC' in Class I–V. Compared to Table 4a where the average dropout rate was 7.9 in 'Others' category, it is 11.5 in case of SCs. All the correlation coefficients are in desired ranges except the one between GER and pupil-teacher ratio which is above 0.8. Overall there is no multicolinearity problem. The R2 is 0.57 and the F value is 4.48 which show goodness of fit of the regression. The sign of the three estimated coefficients is as expected for percentage of rural population, literacy and pupil-teacher ratio. The highest value of the standardised estimate occurs with the literacy rate.

Table 6 presents the results for the data set of 'ST' category in the school level of 1 to 5. The average dropout rate in this category is 25.7 which is higher than SC and 'Others' categories. The correlation matrix does not show multicolinearity, the R2 and F tests also give good results. Except the coefficient of pupil teacher ratio, all other four coefficients' sign is as expected. The highest of the standardised coefficient is for literacy rate at 0.74 indicating the strong influence of it on dropout rate.

The graphical test for the existence of heteroskedasticity presents the error variation and variation in the estimated dependent variable in a two-dimensional graph. A systematic pattern of the scatter points suggests the presence of heteroskedasticity. The SPSS generated graphs Figures 1–3, in general, indicate that there is no problem of heteroskedasticity.

Tables 7, 8 and 9 (Appendix–I) present the regression results for three social categories in school level for Class I–VIII.

As the figures in Table 7 show, the average dropout rate in 'Others', SC and ST categories are 18.38, 27. 31 and 47.65, respectively in school level for Class I–VIII. In this data set multicoliearity is absent; R2 and F values are significant. The algebraic sign is as expected in case of percentage of rural population and literacy rate. Further, literacy rate has astrong influence on the dropout rate as its standardised coefficient is the maximum at –1.16, –0.5 and –102 in the three social categories.

Tables 10, 11 and 12 (Appendix–I) contain the regression results of datasets relating to 'Others', SC and ST categories in school level for Class I–X.

The average dropout rates are 26.32 per cent, 35.36 per cent and

59.05 per cent in 'Others', SC and ST categories. There is serious multicoliearity problem in these three data sets. Other statistics are also good. As per the standardised coefficients data shown in Table 3b, the highest coefficient occurs again in case of literacy rate which is –0.685, –0.635 and –1.00 in 'Others', SC and ST categories.

Conclusion and Suggestions

This study is undertaken to examine the different factors which influence the school dropout rate among children at three different school levels, Class I–V, I–VIII and I–Xin three different social categories — 'Others', SC and ST. Treating school dropout rate as dependent variable, five explanatory variables are included in the model and linear regression is estimated for the nine possible datasets.

The results have shown the following patterns:

- The dropout rate is higher among ST and SC compared to 'Others' social categories based on the average dropout rate computed in the different datasets.
- In most cases the prevailing literacy rate turned out to be the most significant factor followed by percentage of rural population and pupil-teacher ratio in determining the dropout rate based on their standardised regression coefficients.

While literacy rate is a social factor the percentage of rural population may be understood as an economic factor. Thus, school dropout rate is determined both by social and economic factors.

Although gross enrolment ratio is rising steadily over time due to government policies aiming at improving infrastructure — both physical and human — higher rates of school dropout are persisting resulting in large numbers of children found out of school. Based on the results of this study, it is suggested that specific policies aiming at specific causes are essential. Spreading awareness among illiterate parents about the importance and benefits of education of their children is important. Offering free education in public schools coupled with mid-day meals, free books and clothes will go a long way in attracting the children to schools. Monitoring the effective implementation of schemes and policies is very essential.

Appendix — I

Table 4
Regression Results of Dataset: Others Category, Level I–V

Descriptive Statistics			
	Mean	***Std. Deviation***	***N***
Dropout_rate	7.9096	11.95619	23
Percent_ruralpop	68.2404	18.96397	23
Literacy_rate	66.2939	6.44088	23
Pupil_teacher_ratio	26.9130	3.86021	23
GER	93.7283	8.27089	23
MPCE	1522.9857	394.90229	23

Correlations							
		Dropout Rate	***Percent Ruralpop***	***Literacy Rate***	***Pupil Teacher Ratio***	***Ger***	***Mpce***
Pearson Correlation	Dropout_rate	1.000	.106	-.453	.249	.334	-.050
	Percent_ ruralpop	.106	1.000	-.758	-.568	-.500	-.674
	Literacy_rate	-.453	-.758	1.000	.241	.315	.654
	Pupil_teacher_ ratio	.249	-.568	.241	1.000	.217	.267
	GER	.334	-.500	.315	.217	1.000	.411
	MPCE	-.050	-.674	.654	.267	.411	1.000

Model Summary				
Model	***R***	***R^2***	***Adjusted R^2***	***Std. Error of the Estimate***
1	.757	.572	.447	8.89299

ANOVA						
Model		***Sum of Squares***	***df***	***Mean Square***	***F***	***Sig.***
1	Regression	1800.462	5	360.092	4.553	.008
	Residual	1344.451	17	79.085		
	Total	**3144.912**	**22**			

Coefficients						
Model		***Unstandardised Coefficients***		***Standardised Coefficients***	***t***	***Sig.***
		B	***Std. Error***	***Beta***		
1	(Constant)	–8.455	65.867		–.128	.899
	Percent_ruralpop	.083	.221	.131	.374	.713
	Literacy_rate	–1.368	.507	–.737	–2.698	.015
	Pupil_teacher_ ratio	1.042	.646	.336	1.611	.126
	GER	.664	.272	.459	2.441	.026
	MPCE	.007	.007	.242	1.059	.304

Table 5
Regression Results of Dataset: SC Category, Level I–V

Descriptive Statistics			
	Mean	***Std. Deviation***	***N***
Dropout_rate	11.5117	9.87123	23
Percent_ruralpop	68.2404	18.96397	23
Literacy_rate	62.1557	6.89749	23
Pupil_teacher_ratio	26.9130	3.86021	23
GER	111.6052	23.65894	23
MPCE	1522.9857	394.90229	23

Correlations							
		Dropout Rate	***Percent Ruralpop***	***Literacy Rate***	***Pupil Teacher Ratio***	***GER***	***MPCE***
Pearson Correlation	Dropout_rate	1.000	.144	–.611	.233	.243	.023
	Percent_ ruralpop	.144	1.000	–.607	–.568	–.787	–.674
	Literacy_rate	–.611	–.607	1.000	–.037	.190	.533
	Pupil_ teacher_ratio	.233	–.568	–.037	1.000	.809	.267
	GER	.243	–.787	.190	.809	1.000	.627
	MPCE	.023	–674	.533	.267	.627	1.000

Model Summary				
Model	***R***	***R^2***	***Adjusted R^2***	***Std. Error of the Estimate***
1	.754	.569	.442	7.37520

ANOVA						
Model		***Sum of Squares***	***df***	***Mean Square***	***F***	***Sig.***
1	Regression	1219.015	5	243.803	4.482	.009b
	Residual	924.690	17	54.394		
	Total	**2143.706**	**22**			

Coefficients						
Model		***Unstandardised Coefficients***		***Standardised Coefficients***	***t***	***Sig.***
		B	***Std. Error***	***Beta***		
1	(Constant)	58.903	49.228		1.197	.248
	Percent_ruralpop	.048	.206	.093	.234	.818
	Literacy_rate	–1.139	.393	–.796	–2.899	.010
	Pupil_teacher_ ratio	–.355	.818	–.139	–.435	.669
	GER	.162	.196	.389	.827	.420
	MPCE	.008	.007	.303	1.120	.278

Table 6
Regression Results of Dataset: ST Category, Level I–V

Descriptive Statistics			
	Mean	***Std. Deviation***	***N***
Dropout_rate	25.65	15.19	23
Percent_ruralpop	68.24	18.96	23
Literacy_rate	50.90	6.06	23
Pupil_teacher_ratio	26.91	3.86	23
GER	120.96	39.79	23
MPCE	1522.99	394.90	23

Correlations							
		Dropout Rate	***Percent Ruralpop***	***Literacy Rate***	***Pupil Teacher Ratio***	***GER***	***MPCE***
Pearson Correlation	Dropout_rate	1.0000	.2830	–5213	.1209	.0299	–1765
	Percent_ ruralpop	.2830	1.0000	–.6268	–.5679	–6519	–6744
	Literacy_rate	–5213	–.6268	1.0000	.4016	.4361	.6304
	Pupil_teacher_ ratio	.1209	–.5679	.4016	1.0000	.6336	.2669
	GER	.0299	–.6519	.4361	.6336	1.0000	.4746
	MPCE	–1765	–6744	.6304	.2669	.4746	1.0000

Model Summary				
Model	***R***	***R^2***	***Adjusted R^2***	***Std. Error of the Estimate***
1	.715	.511	.367	12.08564

ANOVA						
Model		***Sum of Squares***	***df***	***Mean Square***	***F***	***Sig.***
1	Regression	2591.097	5	518.219	3.548	.022
	Residual	2483.064	17	146.063		
	Total	**5074.161**	**22**			

Coefficients						
Model		***Unstandardised Coefficients***		***Standardised Coesfficients***	***t***	***Sig.***
		B	***Std. Error***	***Beta***		
1	(Constant)	14.819	47.750		.310	.760
	Percent_ruralpop	.370	.235	.461	1.574	.134
	Literacy_rate	-1.870	.593	-.746	-3.154	.006
	Pupil_teacher_ratio	1.843	.933	.468	1.975	.065
	GER	.065	.096	.170	.678	.507
	MPCE	.015	.010	.399	1.554	.139

Table 7
Regression Results of Dataset: Others, Level: I–VIII

Descriptive Statistics			
	Mean	***Std. Deviation***	***N***
Dropout_rate	18.3822	13.56819	23
Percent_ruralpop	68.2404	18.96397	23
Literacy_rate	66.2939	6.44088	23
Pupil_teacher_ratio	22.9130	3.60445	23
GER	94.1600	12.76836	23
MPCE	1522.9857	394.90229	23

Correlations							
		Dropout Rate	***Percent Ruralpop***	***Literacy Rate***	***Pupil Teacher Ratio***	***GER***	***MPCE***
Pearson Correlation	Dropout_rate	1.000	.031	-.488	.341	.108	.059
	Percent_ ruralpop	.031	1.000	-.758	-.392	-.117	-.674
	Literacy_rate	-.488	-.758	1.000	.103	.126	.654
	Pupil_teacher_ ratio	.341	-.392	.103	1.000	-.058	.216
	GER	.108	-.117	.126	-.058	1.000	.250
	MPCE	.059	-.674	.654	.216	.250	1.000

Model Summary				
Model	***R***	***R^2***	***Adjusted R^2***	***Std. Error of the Estimate***
1	.808	.652	.550	9.10145

ANOVA						
Model		***Sum of Squares***	***df***	***Mean Square***	***F***	***Sig.***
1	Regression	2641.886	5	528.377	6.379	.002
	Residual	1408.219	17	82.836		
	Total	**4050.105**	**22**			

Coefficients						
Model		***Unstandardised Coefficients***		***Standardised Coefficients***	***t***	***Sig.***
		B	***Std. Error***	***Beta***		
1	(Constant)	154.325	52.404		2.945	.009
	Percent_ruralpop	-.337	.189	-.471	-1.787	.092
	Literacy_rate	-2.445	.511	-1.161	-4.790	.000
	Pupil_teacher_ratio	.707	.622	.188	1.135	.272
	GER	.109	.158	.102	.687	.501
	MPCE	.015	.007	.434	2.083	.053

Table 8
Regression Results of Data Set: SC, Level: I–VIII

Descriptive Statistics			
	Mean	***Std. Deviation***	***N***
Dropout_rate	27.3148	9.56552	23
Percent_ruralpop	68.2404	18.96397	23
Literacy_rate	62.1557	6.89749	23
Pupil_teacher_ratio	22.9130	3.60445	23
GER	101.3461	20.07886	23
MPCE	1522.9857	394.90229	23

Correlations							
		Dropout Rate	***Percent Ruralpop***	***Literacy Rate***	***Pupil Teacher Ratio***	***GER***	***MPCE***
Pearson Correlation	Dropout_rate	1.000	.006	–.502	.459	.416	.170
	Percent_ ruralpop	.006	1.000	–.607	–.392	–.823	–.674
	Literacy_rate	–.502	–.607	1.000	–.098	.229	.533
	Pupil_teacher_ ratio	.459	–.392	–.098	1.000	.662	.216
	GER	.416	–.823	.229	.662	1.000	.655
	MPCE	.170	–.674	.533	.216	.655	1.000

Model Summary				
Model	***R***	***R^2***	***Adjusted R^2***	***Std. Error of the Estimate***
1	.799	.639	.533	6.54023

ANOVA						
Model		***Sum of Squares***	***df***	***Mean Square***	***F***	***Sig.***
1	Regression	1285.813	5	257.163	6.012	.002
	Residual	727.168	17	42.775		
	Total	**2012.981**	**22**			

Coefficients						
Model		***Unstandardised Coefficients***		***Standardised Coefficients***	***t***	***Sig.***
		B	***Std. Error***	***Beta***		
1	(Constant)	4.158	45.574		.091	.928
	Percent_ruralpop	.256	.204	.507	1.254	.227
	Literacy_rate	-.712	.356	-.513	-1.998	.062
	Pupil_teacher_ratio	.220	.581	.083	.379	.709
	GER	.328	.211	.688	1.552	.139
	MPCE	.008	.006	.316	1.328	.202

Table 9
Regression Results of Data Set: ST, Level VI–VIII

Descriptive Statistics			
	Mean	***Std. Deviation***	***N***
Dropout_rate	47.6452	14.49915	23
Percent_ruralpop	68.2404	18.96397	23
Literacy_rate	50.9048	6.05727	23
Pupil_teacher_ratio	22.9130	3.60445	23
GER	106.9843	26.86056	23
MPCE	1522.9857	394.90229	23

Correlations							
		Dropout Rate	***Percent Ruralpop***	***Literacy Rate***	***Pupil Teacher Ratio***	***GER***	***MPCE***
Pearson Correlation	Dropout_rate	1.000	.157	-.641	.115	-.040	-.099
	Percent_ ruralpop	.157	1.000	-.627	-.392	-.851	-.674
	Literacy_rate	-.641	-.627	1.000	.188	.525	.630
	Pupil_teacher_ ratio	.115	-.392	.188	1.000	.562	.216
	GER	-.040	-.851	.525	.562	1.000	.572
	MPCE	-.099	-.674	.630	.216	.572	1.000

Model Summary				
Model	***R***	***R^2***	***Adjusted R^2***	***Std. Error of the Estimate***
1	.788	.621	.510	10.15137

ANOVA						
Model		***Sum of Squares***	***df***	***Mean Square***	***F***	***Sig.***
1	Regression	2873.100	5	574.620	5.576	.003
	Residual	1751.855	17	103.050		
	Total	**4624.955**	**22**			

Coefficients						
Model		***Unstandardised Coefficients***		***Standardised Coefficients***	***t***	***Sig.***
		B	***Std. Error***	***Beta***		
1	(Constant)	125.533	44.218		2.839	.011
	Percent_ruralpop	.019	.252	.025	.077	.940
	Literacy_rate	-2.447	.493	-1.022	-4.968	.000
	Pupil_teacher_ratio	.407	.744	.101	.547	.591
	GER	.122	.174	.226	.700	.493
	MPCE	.015	.008	.411	1.892	.076

Table 10
Regression Results of Data Set: Others – Level: IX

Descriptive Statistics			
	Mean	***Std. Deviation***	***N***
Dropout_rate	26.3243	16.34406	23
Percent_ruralpop	68.2404	18.96397	23
Literacy_rate	66.2939	6.44088	23
Pupil_teacher_ratio	43.2174	11.65784	23
GER	88.5748	10.16887	23
MPCE	1522.9857	394.90229	23

Correlations							
		Drop-out Rate	***Percent Rural-pop***	***Literacy Rate***	***Pupil Teacher Ratio***	***GER***	***MPCE***
Pearson Correlation	Dropout_rate	1.000	.106	-.294	.237	.394	.030
	Percent_ruralpop	.106	1.000	-.758	.432	-.237	-.674
	Literacy_rate	-.294	-.758	1.000	-.623	.245	.654
	Pupil_teacher_ratio	.237	.432	-.623	1.000	-.074	-.250
	GER	.394	-.237	.245	-.074	1.000	.307
	MPCE	.030	-.674	.654	-.250	.307	1.000

Model Summary				
Model	***R***	***R^2***	***Adjusted R^2***	***Std. Error of the Estimate***
1	.604	.365	.178	14.81577

ANOVA						
Model		***Sum of Squares***	***df***	***Mean Square***	***F***	***Sig.***
1	Regression	2145.202	5	429.040	1.955	.138
	Residual	3731.619	17	219.507		
	Total	**5876.821**	**22**			

Coefficients						
Model		***Unstandardised Coefficients***		***Standardised Coefficients***	***t***	***Sig.***
		B	***Std. Error***	***Beta***		
1	(Constant)	71.011	81.433		.872	.395
	Percent_ruralpop	-.104	.274	-.121	-.381	.708
	Literacy_rate	-1.738	.942	-.685	-1.844	.083
	Pupil_teacher_ratio	-.059	.360	-.042	-.163	.872
	GER	.730	.328	.454	2.228	.040
	MPCE	.010	.012	.246	.857	.403

Table 11
Regression Results of Data Set: SC – Level: IX

Descriptive Statistics			
	Mean	***Std. Deviation***	***N***
Dropout_rate	35.3591	10.37099	23
Percent_ruralpop	68.2404	18.96397	23
Literacy_rate	62.1557	6.89749	23
Pupil_teacher_ratio	43.2174	11.65784	23
GER	95.8900	18.19161	23
MPCE	1522.9857	394.90229	23

Correlations							
		Drop-out Rate	***Percent Ruralpop***	***Lit-eracy Rate***	***Pupil Teacher Ratio***	***GER***	***MPCE***
Pearson Correlation	Dropout_rate	1.000	.006	-.395	.195	.278	.120
	Percent_ruralpop	.006	1.000	-.607	.432	-.809	-.674
	Literacy_rate	-.395	-.607	1.000	-.653	.309	.533
	Pupil_teacher_ratio	.195	.432	-.653	1.000	-.265	-.250
	GER	.278	-.809	.309	-.265	1.000	.665
	MPCE	.120	-.674	.533	-.250	.665	1.000

Model Summary				
Model	***R***	***R^2***	***Adjusted R^2***	***Std. Error of the Estimate***
1	.615	.378	.195	9.30466

ANOVA						
Model		***Sum of Squares***	***df***	***Mean Square***	***F***	***Sig.***
1	Regression	894.460	5	178.892	2.066	.120
	Residual	1471.802	17	86.577		
	Total	**2366.263**	**22**			

Coefficients						
Model		***Unstandardised Coefficients***		***Standardised Coefficients***	***t***	***Sig.***
		B	***Std. Error***	***Beta***		
1	(Constant)	57.357	59.036		.972	.345
	Percent_ruralpop	.114	.232	.209	.493	.628
	Literacy_rate	-.954	.516	-.635	-1.850	.082
	Pupil_teacher_ratio	-.113	.234	-.127	-.481	.637
	GER	.237	.223	.416	1.063	.303
	MPCE	.008	.008	.291	.971	.345

Table 12

Regression Results of Data Set: ST, Level: I–X

Descriptive Statistics			
	Mean	***Std. Deviation***	***N***
Dropout_rate	59.0452	11.95117	23
Percent_ruralpop	68.2404	18.96397	23
Literacy_rate	50.9048	6.05727	23
Pupil_teacher_ratio	43.2174	11.65784	23
GER	96.6874	24.00537	23
MPCE	1522.9857	394.90229	23

Correlations							
		Dropout Rate	***Percent Ruralpop***	***Literacy Rate***	***Pupil Teacher Ratio***	***GER***	***MPCE***
Pearson Correlation	Dropout_rate	1.000	.027	-.535	.194	.013	.003
	Percent_ruralpop	.027	1.000	-.627	.432	-.838	-.674
	Literacy_rate	-.535	-.627	1.000	-.372	.553	.630
	Pupil_teacher_ ratio	.194	.432	-.372	1.000	-.162	-.250
	GER	.013	-.838	.553	-.162	1.000	.554
	MPCE	.003	-.674	.630	-.250	.554	1.000

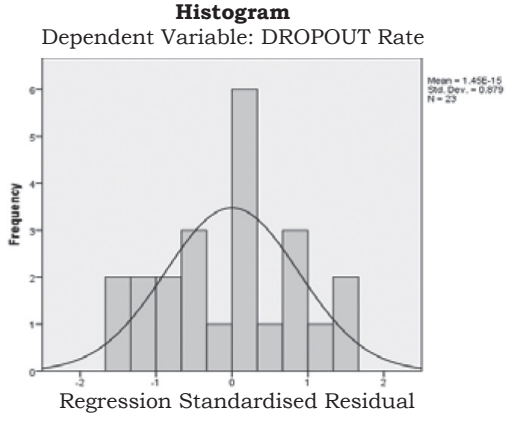
Model Summary				
Model	***R***	***R^2***	***Adjusted R^2***	***Std. Error of the Estimate***
1	.736	.541	.406	9.20770

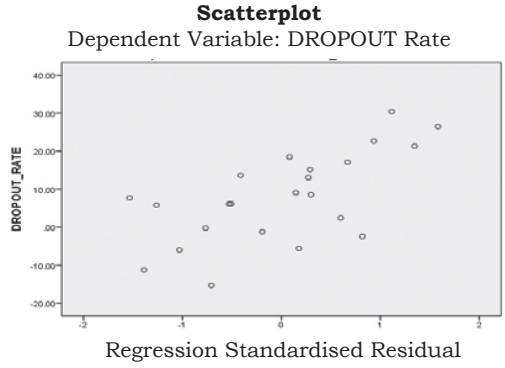
ANOVA						
Model		***Sum of Squares***	***df***	***Mean Square***	***F***	***Sig.***
1	Regression	1700.980	5	340.196	4.013	.014
	Residual	1441.288	17	84.782		
	Total	**3142.269**	**22**			

Coefficients						
Model		***Unstandardised Coefficients***		***Standardised Coefficients***	***t***	***Sig.***
		B	***Std. Error***	***Beta***		
1	(Constant)	135.488	37.628		3.601	.002
	Percent_ruralpop	-.095	.252	-.151	-.378	.710
	Literacy_rate	-1.979	.460	-1.003	-4.300	.000
	Pupil_teacher_ratio	.026	.211	.026	.125	.902
	GER	.106	.167	.212	.634	.535
	MPCE	.013	.007	.422	1.743	.099

Appendix — II

Others:





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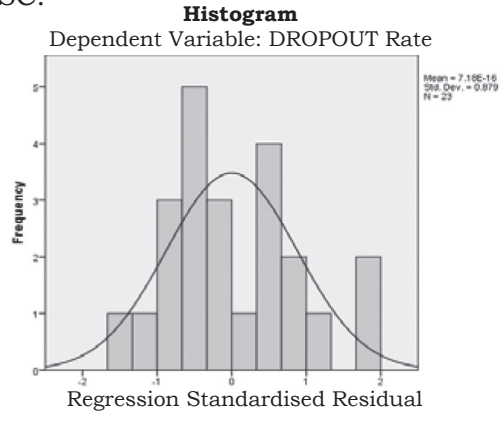

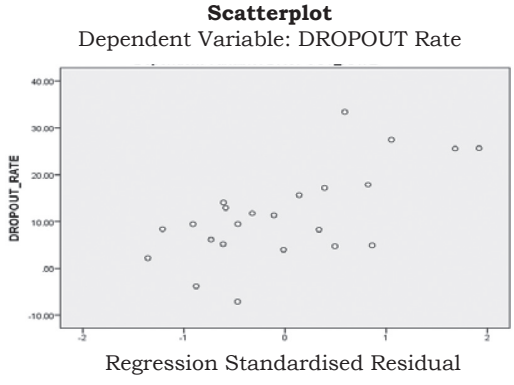

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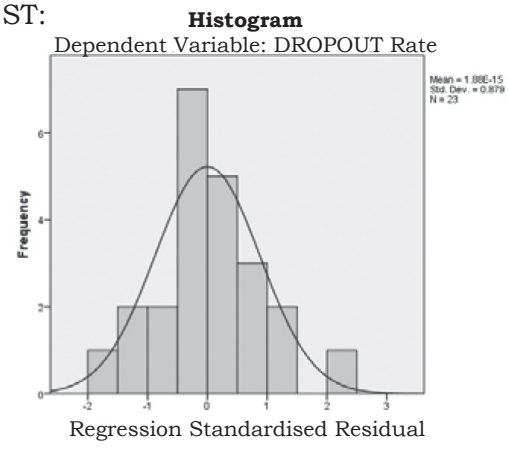

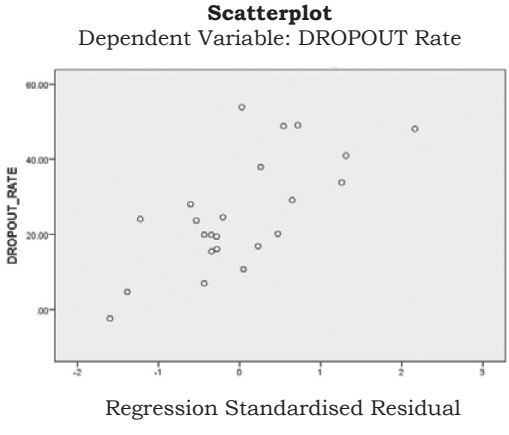

Figure 1. School Level I–V

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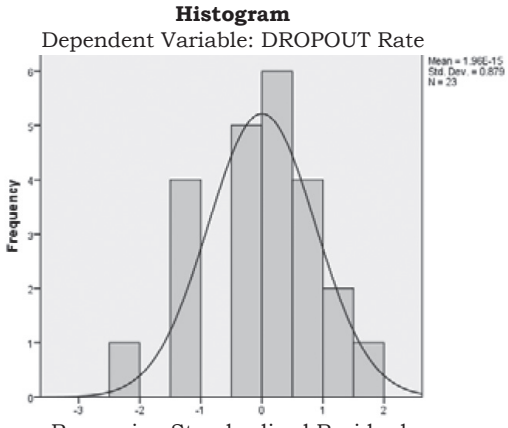

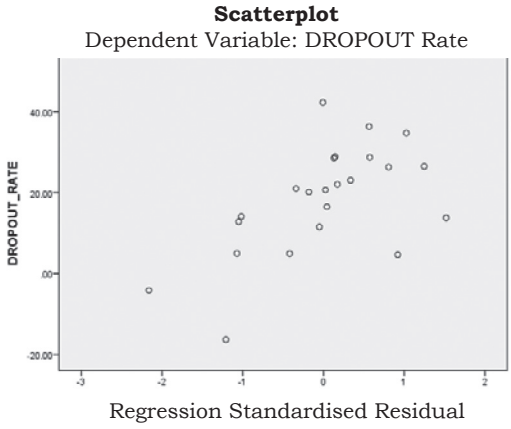

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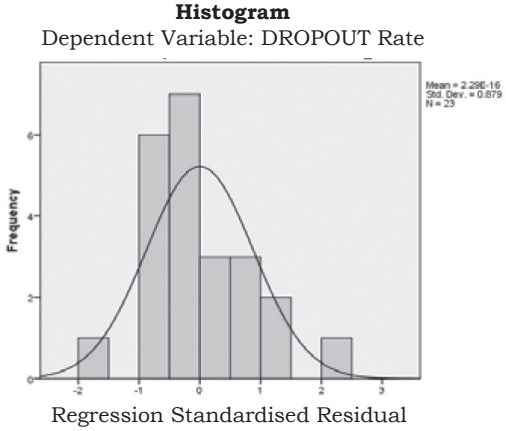

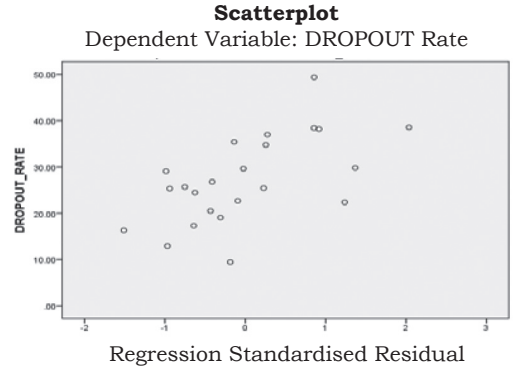

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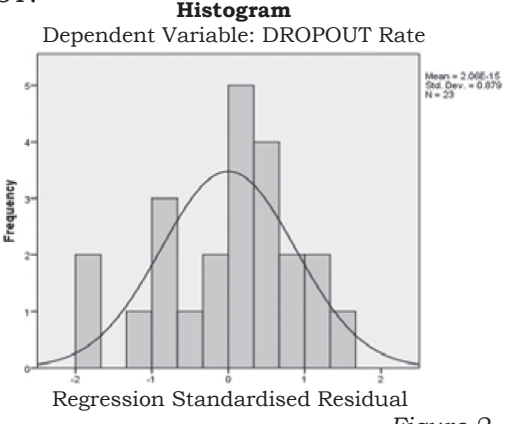

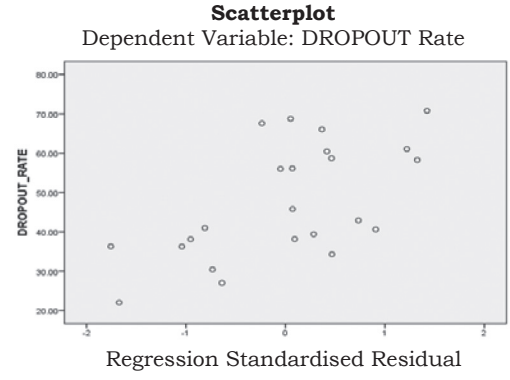

Figure 2. School Level I–VIII

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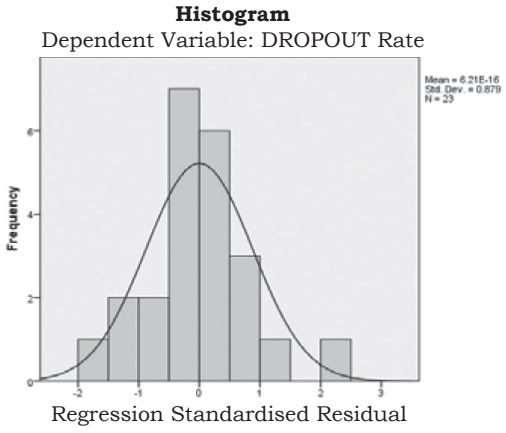

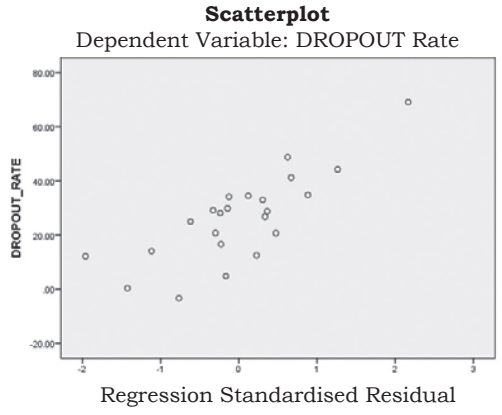

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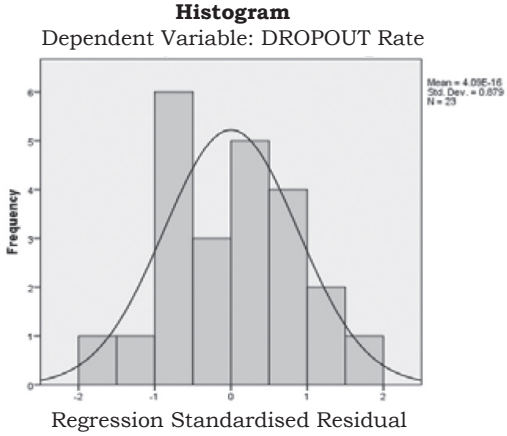

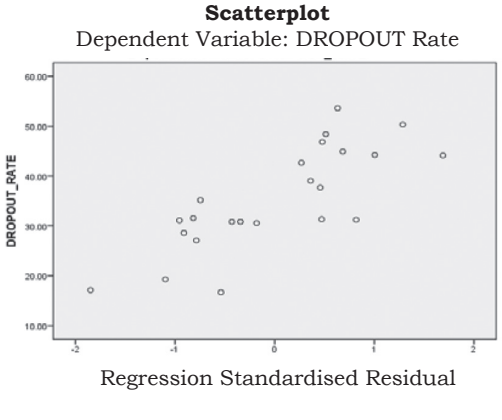

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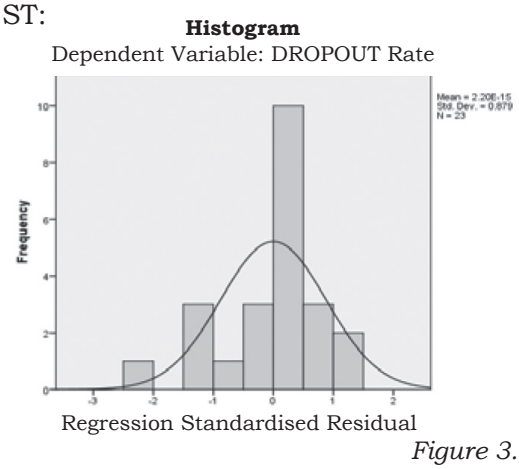

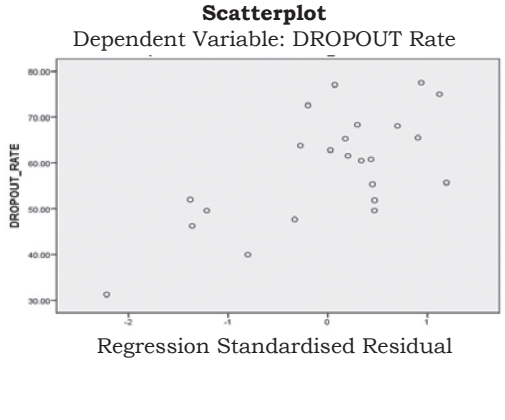

Figure 3. School Level I–X

End Notes

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Educational Development Index of Bihar

Towards a Better Tomorrow

Chandra P.B. Singh*

Abstract

The study was designed to compute district-wise educational development index of Bihar. At the same time, an attempt was made to assess the trend of improvement in elementary education for the last few years. U-DISE data for the last two years (2014–15 and 2015–16) was analysed and compared with the baseline data. Bihar showed significant improvement on many parameters of elementary education. Despite the fact that Bihar is yet to achieve the desirable level but the progress is evident. Other than learning achievement, in terms of quality Bihar has shown her firm determination to change the gloomy picture of elementary education. The findings reflect a positive trend of upward movement. Right from access to teachers in school, Bihar has made progress in the light of RTE Act, 2009.

Introduction

The study conducted by Bihar Education Project Council, Patna (2015–16) on U-DISE (unified district information of school education) and later on, compiled by National University of Education and Planning, New Delhi (2016) for generating composite scenario of elementary education in India gives rise to two distinct patterns of data of school education — within the state and between states. BEPC (2015–16) presents scenario of elementary education of 38 districts of Bihar. These two analyses generate time series data for understanding the effectiveness of Sarva Shiksha

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Abhiyan (SSA) within the state and between the states. Bihar when compared with other states, trails on many educational parameters. But the reality is something else. Within the state of Bihar some districts have indeed, performed well and have consistently maintained their rank while some of them have improved gradually. Hence, it is too early to conclude that Bihar accounts for poor performance on the elementary education front. For the last one decade the Government of Bihar (GoB) has initiated a plethora of interventions to improve the status of elementary education. It has made some significant effects on school education. This paper examines the extent of effect of various educational programmes on elementary education in Bihar in terms of Educational Development Index (EDI) designed by NUEPA. Based on the U-DISE data an effort was made to compute an Educational Development Index (EDI) separately for each parameter – access, infrastructure, teachers and outcomes and also a composite index for the state. The basic purpose of EDI was to get a relative position of a district vis-à-vis other districts of Bihar on each parameter. EDI can be applied to bring about variation in interventions and make categorical treatment of the performing districts. It is desirable to analyse district-wise educational development with reference to access, infrastructure, teachers and outcome.

Objectives of the Study

The objectives of the study are to

(i) assess universal access, enrolment and retention in Bihar,

(ii) map out availability of infrastructure and teachers and

(iii) compute Educational Development Index (EDI) of each district.

Methodology

Design of the Study

The study examined U-DISE data (2014–15 and 2015–16) available at www.udise.in and www.bepcssa.in for educational development index (EDI). For baseline the data of 2005–06 was taken into consideration. The basic aim was to ascertain the trend of progression in elementary education after interventions. The core parameters — access, infrastructure, teachers and outcomes designed by National Institute of Educational Planning and Administration (NIEPA) were included in the study. On each parameter there existed a set of sub-parameters (22 variables). For each sub-parameter the baseline data was decided. Some other sources of data, such as All India Educational Survey (AIES 2002, 2009) and Annual Work Plan and Budget (AWP & B 2015–16, 2016–17) of SSA in Bihar were taken into consideration. It was a time series data based on U-DISE data capture format (DCF).

Tool Used

The study followed the tool suggested by NUEPA for computing Educational Development Index (EDI) for two separate years (2014–15 and 2015–16). Variables (n=22) used by NIEPA for analysis were taken into consideration while computing EDI. Composite weightage score on each parameter for each district was computed.

Result

(a) Access: Bihar witnessed a significant expansion of schools for the last few years. About 98 per cent habitations had elementary schools. The analysis suggested that upper primary schools were more equitably distributed among 38 districts. The SSA had substantially strengthened primary as well as upper primary schools (Figure 1). The total enrolment at upper primary level was consistently increasing for the past several years. An overall increase at primary level was 5.4 per cent (about 8.3 lakh) from the previous year (2014–15). The enrolment at upper primary classes had increased significantly (7 per cent) in the state during the same period. While enrolment for primary classes increased by 43.94 per cent from 2005–06 to 2015–16, it climbed up to 235.65 per cent for upper primary classes. Out of 234.32 lakh, 214.73 (91.64 per cent) lakh students were in the government managed schools and the remaining 19.59 lakh (8.36 per cent) in private managed schools. There existed 4.60 upper primary schools or sections to serve per one thousand population of age group 11–13+. Despite a significant achievement on access parameter, a number of habitations remained deprived of primary schooling facilities within one kilometer and upper primary schools within a distance of three kilometers. Nevertheless, access to elementary education in tune with the increased Gross Enrolment Ratio (GER) required many more school buildings both for primary and upper primary levels. It was evident that the Department of Education (the GoB) was the main provider of

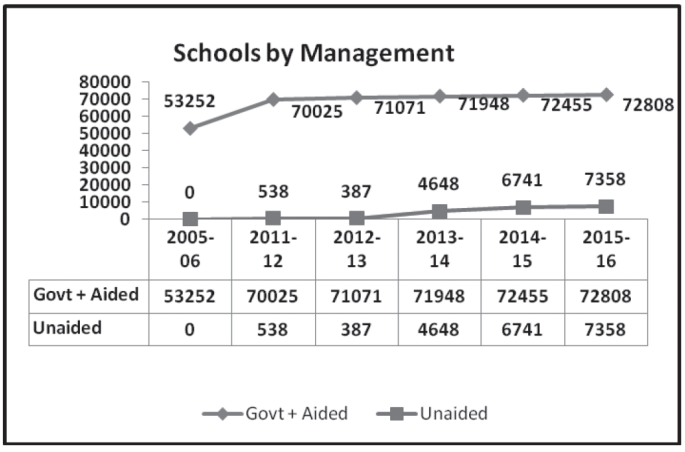

Figure 1. School by management (in %)

elementary education followed by the government-aided schools (Figure 1).

(b) Infrastructure: The basic infrastructure facilities, such as classrooms, toilets, drinking water, etc., help improve attendance, retention and facilitate learning processes. The RTE Act, 2009, lays down the minimum physical and academic infrastructure for a school. Strangely, most of the government schools did not fulfill the norms as prescribed by the RTE Act. Of 70,860 government schools, only 9,505 (13 per cent) complied with RTE norms for teachers. Around 34,337 (82 per cent) primary schools did not comply with RTE norms for PTR while it was 27,018 (about 93 per cent) in case of upper primary/secondary/higher secondary schools. Similarly, only 16,973 (24 per cent) schools complied with RTE norms for classrooms. In case of upper primary/secondary/higher secondary schools it was about 86 per cent. A large number of primary schools (opened after 2006–07) did not have their own school buildings and other teaching learning facilities. It was important to highlight that Bihar was facing acute shortage of the government as well as the donated land for construction of new school buildings (NSBs). However, the state was making sincere efforts to make land available for NSBs. The situational analysis further revealed that student classroom ratio (92:1) was dense in 2005–06. However, it got reduced to 57:1 in 2015–16. A large number of schools (2.76 lakh) got additional classrooms till 2015–16. In case of middle schools the existing infrastructure was certainly better. But, some essential facilities lacked in many of these schools. It was important to mention that as per U-DISE data 2014–15, there existed a huge requirement of additional classrooms (approximately, 2.14 lakh) in the state. The pace of completion of the sanctioned additional classrooms (ACR) as well school buildings was relatively slow. Though the state had been able to provide basic amenities like toilet separately for boys and girls and drinking water facilities for many elementary schools, a real challenge revolved around maintaining toilets and making it usable for the children. Opening new schools would merely not serve the purpose. The infrastructure of elementary education in Bihar painted a disappointing picture. Facilities available in schools revealed that Bihar was below the national average. About 10 per cent primary schools had no drinking water facility. Separate girls' toilet facilities were still inadequate. Only 46.62 per cent schools had a boundary wall.

About 37.51 per cent schools did not have a kitchen shed. About 64.70 per cent schools had no playground. Two-third schools had no electricity connection.

(c) Teacher: Bihar had a large number of teaching forces making the schooling system more vibrant. At the state level, only 12 per cent primary schools (all management) existed which had more than five teachers (U-DISE 2015–16). However, only 9 per cent (the government management) primary schools had more than five teachers. About 28 per cent primary schools had four-five teachers. Around 54 per cent primary schools had two-three teachers. On an average the number of teachers in all categories of schools was 5.39 in 2015–16 which was only 3.86 in 2005–06. The situational analysis further indicated that pupil teacher ratio (PTR) was 64.82 in 2005–06. This got reduced to 56.20 in 2015–16. There existed some schools which did not have adequate number of teachers (Figure 2). In 2005–06 about 26 per cent female teachers were deployed in the schools. It rose up to 40 per cent in 2015–16. Still it was far away from satisfactory inclusion of female teachers in the schooling system. Female teachers were the best option for primary level education. Many schools run without a Head Master (HM) and the graduate trained teachers. Upper Primary teachers faced difficulties in teaching science and mathematics as they did not have science teachers.

Almost all DIETs, PTECs and B.Ed. colleges in Bihar were gasping by the end of 2005–06. They were dysfunctional because of poor infrastructure facilities, stagnated human resources and predominating restraining forces in the institutions. Right now, the State Council of Educational Research and Training (SCERT) in Bihar has made almost all DIETS functional as the untrained teachers were being trained under Open Distance Learning (ODL) Programme. Though

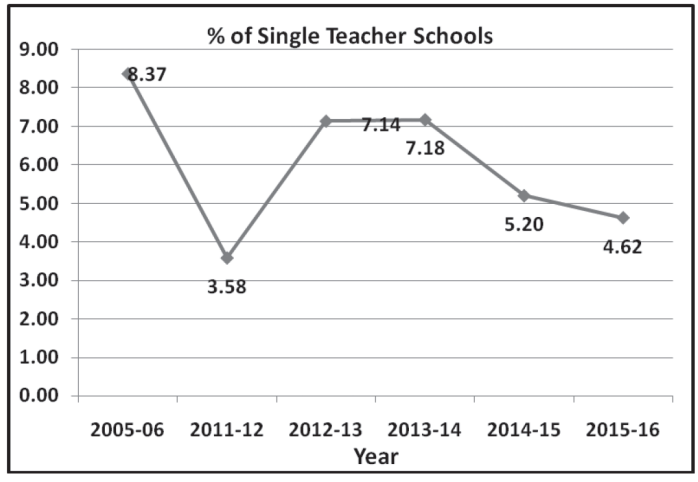

Figure 2. Single teacher schools (in %)

facilities available for pre-service and in-service training of teachers were inadequate in the state, they had delivered tangible results. The SCERT by its innovative practices played an important role in capacity building programme of newly appointed teachers (BEPC 2015–16). It showed an affirmative action aimed at revamping the existing training institutions and setting-up of new institutions. Block Resource Centre (BRCs), Cluster Resource Centre (CRCs) and School Management Committee (SMC) were constituted in all districts. Though these bodies provided a little academic support to teachers as well as schools, they could not be cornered in school education.

(d) Enrolment and Out of School Children (OOSC): The Gross Enrolment Ratio (GER) at the primary level was consistent over the years (108 per cent, 2016). The same trend for Net Enrolment Ratio (NER) was observed (104 per cent, 2016). No major gender gap was recorded in the GER and NER (<5 per cent). Further the district-wise analysis revealed that the GER of girls was higher than their counterpart in many districts. The data disclosed a substantial increase in GER at upper primary level over the years. The NER at the primary level continued increasing over the years since 2005–06. There was an increase of one per cent point during 2015–16 as compared to the previous year (2014–15). The NER at the primary level required further improvement. The NER of girls was better than that of boys over the years. The Gross Enrolment Ratio at upper primary level had increased by 16 per cent from the previous year. The GER and NER had a difference of about 4 percentage point indicating an inclusion of about 4 per cent underage and overage children at upper primary level. A large number of children left the school before completing the elementary education cycle. It seemed that the existing primary education system transited every fourth or fifth child to upper primary cycle.

It was heartening to note that the transition rate of girl children was better than that of boys. If a child continued up to Class III, the probability of completing the primary cycle was high.

The dropout rate at upper primary level was not very high. The out of school children (OOSC) of SC category was 18.45 per cent in 2006–07 where as, it was 1.77 per cent in 2015–16. The trend of ST and minority children was also encouraging. But more efforts were required to bring them to a minimum level. Although the number of out-of-school children came down to about one per cent, it required a contextual strategy to bring them back to school (Figure 3). Continuous awareness campaign has already been initiated to narrow the gender and social gaps at elementary level. In the light of RTE Act, every

elementary school was supposed to prepare School Development Plans (SDP). Although this bottom-up approach to planning was a kind of democratic engagement, there existed non-readiness to school development plan by the stakeholders.

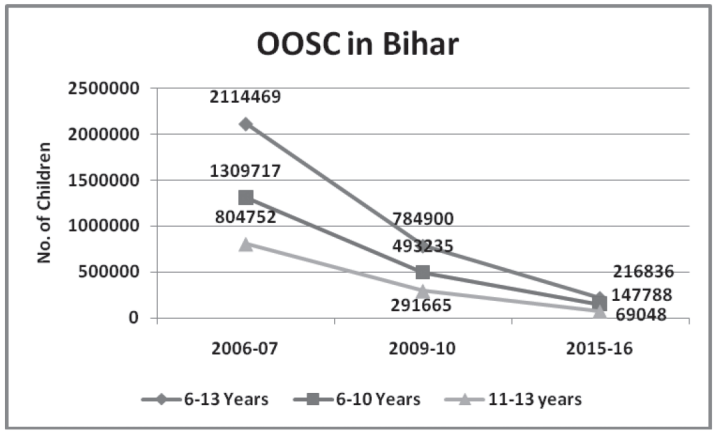

Figure 3. Status of OOSC in Bihar by age

(e) Learning Outcomes: Despite improvement in access and retention, the learning outcomes of children continued to be a serious concern. Studies (NAS 2012) confirmed that the children were far away from basic learning skills during their schooling. Many children reaching up to Class V could not read a simple sentence and failed to work out numerical problems (NAS 2012, SCERT 2017). Students especially girls studying in Class III, V and VIII secured less than 50 per cent marks in Hindi language (NAS 2012). The state mean percentage of KGBV students was around 40 with Standard Deviation 20.57. Of 10 districts where the study was conducted, Nalanda and Jamui secured 54 per cent and 55 per cent, respectively, while Kishanganj and West Champaran underscored by obtaining only 25 per cent and 29 per cent (SCERT 2017). Bhagalpur had 36 per cent, showing 4 per cent below the state mean per cent. Madhepura and Madhubani secured 37 per cent and 38 per cent which was about 23 per cent less than the state mean per cent. The results further, revealed substantial differences in learning outcomes between the highest performing districts (Nalanda followed by Jamui) and the lowest performing districts (Kishanganj followed by West Champaran). A large scale assessment exercise could not ensure quality improvement in learning unless the system was ready to reflect on the findings and use them for improving the quality of teaching and learning processes.

(f) Composite EDI: Analysis of composite elementary education index (EDI) made it apparent that Siwan, Nalanda, Patna, Begusarai and Muzaffarpur were top five districts in the year 2014–15 while Kishanganj, Arwal, Nawada, Purnea and Araria were at the

bottom of ranking (Table 1). In year 2015–16 Siwan and Nalanda rejoined in top five but three new districts — Aurangabad, Vaishali and Jamui were included in top five districts from 11th, 7th and 9th rank, respectively. It was due to providing access to new primary schools in the uncovered habitation, appointment of teachers and construction of new buildings or classrooms. The state average of composite EDI for the year 2014–15 and 2015–16 was almost same (0.516 and 0.502, respectively). Keeping the base figure of composite EDI to year 2014–15 (0.516), the number of districts above the state average (0.516) were 13, and below it were 25. In year 2015–16 a total number of districts above the state average (0.502) were 15, and below it were 23. Several districts had improved their relative position on various parameters of Composite EDI.

Table 1
Indices and Ranking at Elementary Level: All Districts (2015–16)

S. No.	District	Access		Infrastructure		Teacher		Outcome		All	
		Index	*Rank*	*Index*	*Rank*	*Index*	*Rank*	*Index*	*Rank*	*Index*	*Rank*
1.	Siwan	0.606	8	0.777	1	0.682	1	0.707	3	0.697	1
2.	Aurangabad	0.588	9	0.717	6	0.595	3	0.620	13	0.633	2
3.	Vaishali	0.583	10	0.718	4	0.590	4	0.522	23	0.613	3
4.	Nalanda	0.544	14	0.717	5	0.621	2	0.460	26	0.602	4
5.	Jamui	0.481	19	0.698	7	0.560	7	0.622	12	0.594	5
6.	Gopalganj	0.499	18	0.519	20	0.561	6	0.793	1	0.577	6
7.	Darbhanga	0.537	16	0.752	2	0.404	23	0.608	17	0.574	7
8.	Bhojpur	0.564	12	0.687	8	0.433	20	0.625	11	0.573	8
9.	Begusarai	0.453	23	0.633	12	0.577	5	0.614	15	0.571	9
10.	Patna	0.549	13	0.664	10	0.405	22	0.611	16	0.552	10
11.	Buxar	0.411	26	0.728	3	0.466	16	0.525	21	0.541	11
12.	Munger	0.610	5	0.631	13	0.297	32	0.651	6	0.533	12
13.	Jehanabad	0.474	21	0.645	11	0.379	27	0.616	14	0.523	13
14.	Sheohar	0.666	2	0.329	35	0.387	26	0.762	2	0.504	14
15.	Muzaffarpur	0.579	11	0.581	15	0.451	19	0.361	36	0.503	15
16.	Khagaria	0.399	27	0.584	14	0.470	15	0.525	22	0.497	16
17.	Kaimur	0.364	32	0.576	17	0.504	11	0.436	29	0.480	17
18.	Rohtas	0.364	32	0.576	17	0.504	11	0.436	29	0.480	17
19.	Madhubani	0.318	37	0.672	9	0.455	18	0.360	37	0.469	19
20.	Saran	0.504	17	0.414	29	0.387	24	0.641	8	0.469	20
21.	Sitamarhi	0.469	22	0.475	24	0.333	30	0.666	5	0.467	21
22.	Katihar	0.345	34	0.474	25	0.482	14	0.577	18	0.465	22

23.	Lakhisarai	0.396	29	0.530	19	0.419	21	0.503	24	0.461	23
24.	Arwal	0.632	4	0.506	21	0.309	31	0.391	34	0.457	24
25.	Sheikhpura	0.634	3	0.418	28	0.238	33	0.640	9	0.457	25
26.	E. Champaran	0.389	30	0.287	37	0.532	9	0.668	4	0.452	26
27.	Saharsa	0.426	24	0.379	30	0.523	10	0.451	27	0.445	27
28.	Nawada	0.384	31	0.466	26	0.387	25	0.572	19	0.443	28
29.	Bhagalpur	0.475	20	0.376	31	0.557	8	0.326	38	0.442	29
30.	Banka	0.610	6	0.481	22	0.197	35	0.469	25	0.427	30
31.	Gaya	0.608	7	0.346	34	0.231	34	0.632	10	0.426	31
32.	Kishanganj	0.723	1	0.581	16	0.053	38	0.371	35	0.422	32
33.	Madhepura	0.543	15	0.363	32	0.366	29	0.428	31	0.418	33
34.	Supaul	0.396	28	0.263	38	0.499	13	0.438	28	0.395	34
35.	W. Champaran	0.229	38	0.480	23	0.367	28	0.413	33	0.376	35
36.	Samastipur	0.331	36	0.301	36	0.458	17	0.416	32	0.374	36
37.	Purnia	0.413	25	0.441	27	0.087	37	0.547	20	0.351	37
38.	Araria	0.340	35	0.363	33	0.098	36	0.645	7	0.332	38
	Bihar	0.435		0.498		0.473		0.639		0.502	

Good Average Below average Poor

Discussion and Conclusion

Based on the situational analysis of elementary education in Bihar, one gets an impression that the state has gradually inched towards the goals of SSA. Right from DPEP (District Primary Education Programme) to SSA the state has stamped in some good learning experiences. Though the journey to universalisation of elementary education (UEE) was difficult and tiring, the state continued expanding her capacity for improving the relative status of elementary education. This was a result of aspiration, reflective conversion and understanding complexity. Aspiration referred to personal mastery on the programme. Reflective conversion dealt with mental models (maps of education) and dialogue with lower levels. Understanding complexity was systematic thinking (synergy in team). Taken together, it made a fifth discipline of elementary education. The state had meticulously customised her strategies to make contextually schooling system more relevant and sustainable from the view point of community-ownership programme. This became a point of reference for other states. Some good practices in the field of elementary education (EE) were definitely admirable. Despite some

positive signs of improvement in elementary education, a few grey areas still remain unaddressed for universalisation of elementary education. The Right of Children to Free and Compulsory Education Act, 2009, is a milestone in the history of EE. Strangely, six years have elapsed since its implementation; it has yet to get its effective edge in the state. Although the Government of Bihar, in view of obligations of RTE Act, 2009, has acted affirmative and has introduced some important measures to facilitate enforcement of the RTE Act, 2009, many schools have yet to comply with RTE norms.

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Perception of Higher Secondary School Teachers on the Impact of Anthropogenic Global Warming on Environment

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Abstract

Global warming, the term used to describe a gradual increase in the average temperature of the earth's atmosphere and its oceans, a change that is believed to be permanently changing the earth's climate forever. Anthropogenic global warming refers to the increase in the average temperature of the climate system in recent decades because of human induced actions. Anthropogenic global warming is a worldwide environmental problem not only affecting the nature, but it also affects the life and homes of millions of people. Anthropogenic global warming can be minimised to a great extent, if we eliminate the causes which are mostly human made. The responsibility of controlling anthropogenic global warming rests both on the individual as well as the state. The present investigation was conducted to study the perception of higher secondary school teachers on the impact of anthropogenic global warming on environment. Normative survey was conducted among 390 higher secondary school teachers of various schools of Kannur, Thrissur and Trivandrum districts. The tool used for the study was Teacher's Perception Scale on the Impact of Anthropogenic Global Warming (TPSIAGW). The findings of the study reveal that higher secondary school teachers have an average perception regarding the impact of anthropogenic global warming on environment. It was also found that there exists a significant difference in the perception of science and non-science teachers regarding the impact of anthropogenic global warming on environment and there exists no significant

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difference in their perception when analysed on the basis of sub-sample gender, locale and type of management.

Introduction

"Global Warming, the term used to describe a gradual increase in the average temperature of the earth's atmosphere and its oceans, a change that is believed to be permanently changing the earth's climate forever (Joy 2009)". It is the increase in average temperature of the earth, particularly at the lower atmosphere due to the abundant increase of greenhouse gases. This is primarily due to human intervention and lifestyle that they have adapted in the recent years. In common usage, the term refers to recent warming and implies a human influence. Anthropogenic global warming refers to the increase in the average temperature of the earth's near surface air and oceans in recent decades because of human induced actions. The increased volume of carbon dioxide and other greenhouse gases released by the burning of fossil fuels, deforestation, agriculture, land clearing and other human activities are believed to be the primary sources of global warming that has occurred over the past 50 years. Human activities have altered the chemical composition of the atmosphere through the buildup of greenhouse gases.

Anthropogenic global warming is a worldwide environmental problem due to which there is an abnormal increase in the level of temperature, particularly in a natural environment. Anthropogenic global warming is not only affecting the nature, but it affects the life and homes of millions of people (Joy 2009). Anthropogenic global warming is likely to trigger a series of events which can cause a lot of destruction on the planet. Rising global temperatures are expected to raise sea level, and change precipitation and other local climate conditions. Changing regional climate could alter forests, crop yields, and water supplies. It could also affect human health, animals, and many types of ecosystems. Deserts may expand into existing rangelands, and features of some of our National Parks may be permanently altered.

Anthropogenic global warming will alter the climatic patterns of the planet. As far as precipitation is concerned, it will increase in equatorial, polar and sub-polar regions, and decrease in subtropics. This change in precipitation pattern will trigger drought in some regions, while cause floods in other regions. Warming of the atmosphere will increase the temperature of ocean waters, which will continue being warm for a few centuries. Warm water will lead to frequent natural disasters like hurricanes. Overall, the planet will experience weather conditions, characterised by flood and droughts, heat waves and cold waves and extreme storms like cyclones and tornadoes (Maslin 2004). A rise

in global temperature will also hamper the rich biodiversity of various ecosystems. Anthropogenic global warming will result in loss of habitat for many animal species like polar bears and tropical frogs. More importantly, any change in the climate patterns will seriously affect the migration patterns of various bird species. Irregular patterns of precipitation will affect animals and humans alike.

In case of humans, anthropogenic global warming will affect our food and water supplies as well as our health conditions. Change in precipitation will affect basic necessities, such as agriculture, power production, etc. Increase in the temperature of ocean waters will hamper the fishes in the sea. The sudden change in climate patterns will have a hazardous effect on the human body which will not be able to endure the extreme conditions, a hint of which can be seen in the form of frequent heat waves and cold waves. Increase in natural calamities, such as storms, will lead to heavy human causalities. Infectious diseases will rise to a great extent as disease transmitting insects will adapt to wet and hot conditions. Many people will die of malnutrition as food production will decrease due to frequent droughts and floods.

Anthropogenic global warming can be minimised to a great extent, if we eliminate the causes which are mostly human made. Today, actions are occurring at every level to reduce, to avoid, and to better understand the risks associated with anthropogenic global warming. The responsibility of preventing anthropogenic global warming rests both on individual as well as the state.

Rationale for the Study

The unprecedented increase in population and intensity of human activities, which have occurred largely in this century, has been brought about by the growing mastery of science and its application. This has produced prosperity, improved standards of life and expanded opportunities beyond what earlier generations could have imagined. But these developments have damaged and deteriorated the ecological systems and caused widespread destruction of natural resources base, on which human life and well-being depends. The uncontrolled activities of human beings are damaging the healthy environment more and more.

The pre-service teacher's perceptions of environmental issues, especially greenhouse effect and global warming, examined by Fred and Ava (1999) suggested that pre-service elementary teachers hold many misconceptions about environmental issues, especially global warming and the related greenhouse effect. Ocal et al. (2011), conducted a study on 'Turkish Prospective Teachers' Understanding and Misunderstanding on Global Warming' and the findings revealed that the prospective teachers had some misunderstandings about

global warming. Similarly a study was conducted by Emre (2011) to identify the erroneous knowledge and misconceptions of pre-service elementary teachers about global warming and it was found that the pre-service elementary teachers had knowledge gaps and certain misconceptions about the reasons underlying global warming. Keith et al., (2009) studied about students' beliefs and willingness to act in relation to some specific actions related to global warming and suggested that education could be most the effective in encouraging willingness to take pro-environmental actions to reduce global warming.

The reviews cited above shows that a majority of people have many misconceptions and misunderstandings about the actual causes, consequences and control measures related to anthropogenic global warming. It was also found that people are willing to take some actions for controlling anthropogenic global warming. But, they have some knowledge gaps about the actions to be practiced for controlling anthropogenic global warming. This problem can be solved by the teachers to some extent by increasing their level of awareness and by passing their knowledge to their students.

The potential of education as an effective instrument in preventing and solving the environmental degradation has been recognised since long. The teaching community has to be taken into consideration, for it is the teachers who are molding pupil, the future citizens. He can bear the responsibility for preserving the environment from the problems like anthropogenic global warming. He can bear the responsibility only when he himself is aware about the environment and its problems. So, it becomes necessary to study the perception of higher secondary school teachers on the impact of anthropogenic global warming on environment.

Hypotheses of the Study

H1. Higher Secondary school teachers have a low perception regarding the impact of anthropogenic global warming on environment.

H2. There will be significant difference in the mean scores of perception of Higher Secondary school teachers regarding the impact of anthropogenic global warming on environment when analysed on the basis of Subject (Science and Non-science)

(a) Gender
(b) Locale
(c) Management

Objectives of the Study

1. To study the perception of Higher Secondary school teachers regarding the impact of anthropogenic global warming on environment.
2. To find out if there is a significant difference in the mean scores of perception of Higher Secondary school teachers regarding the

impact of anthropogenic global warming on environment on the basis of Subject (Science and Non-science)
(a) Gender
(b) Locale
(c) Management

Methodology

Examining the objectives of the data, the investigator followed the normative survey method for the study. The sample selected for the study constitutes a representative group of Higher Secondary School Teachers (N=390) from various Higher Secondary Schools of Kannur, Thrissur and Thiruvananthapuram districts. The sample was selected using multistage sampling design.

The tools used for the sudy included 'Teacher's Perception Scale on the Impact of Anthropogenic Global Warming (TPSIAGW)'. TPSIAGW was prepared on the basis of an opinionnaire. The investigator covered the entire areas relating the impact of anthropogenic global warming on environment and health. The statement related to the impact of anthropogenic global warming on environment includes its impact on temperature, sea-level rise, glaciers, snow and ice, extreme weather events, water resources, ecosystems, biogeochemical cycles, biodiversity, agriculture, soil, fuel, energy, transport, infrastructure and economy. This draft form of the TPSIAGW (126 items) was pre-tried out on 100 teachers of various Higher Secondary schools. Based on the suggestions and guidance extended by the experts, items in the TPSIAGW were reduced to 31 items edited in a logical sequence.

The degree of possession of the opinions concerned can be measured by making people respond to statements on a five point scale — these being strongly agree (very true), agree (true), undecided (not sure), disagree (not true), and strongly disagree (not at all true). Then these responses are weighed by assigning numerical value to them. If an item is considered positive, the weightage will be 5, 4, 3, 2, 1 and if it is a negative item, the weighting will be in the reverse order, that is 1 for strongly agree, 2 for agree and so on. The response of a person for all the items in a tool will thus be weighted and the total score obtained will be considered as an index of his opinion towards the issue.

Statistical Techniques used in the Study was Percentage analysis, Critical Ratio and Analysis of Variance (ANOVA).

Result and Discussion

Based on the scores, obtained on the teachers perception scale on the impact of anthropogenic global warming on environment, the total group was classified into High (above M+ σ), Average (between M+ σ & M- σ) and Low (M- σ) perception groups. The distribution of the subjects into different levels is presented in Table 1.

Table 1

Classification of total groups into High, Average and Low perception groups based on the perception of Higher Secondary school teachers regarding the impact of anthropogenic global warming on environment

S. No.	Teachers Perception Group	Subject	
		N	%
1.	High perception group regarding the impact of anthropogenic global warming on environment (above M+ σ)	61	16
2.	Average perception group regarding the impact of anthropogenic global warming on environment (between M+ σ & M- σ)	289	74
3.	Low perception group regarding the impact of anthropogenic global warming on environment (below M- σ)	40	10
Total		**390**	**100**

Table 1 shows that only 16% of the Higher Secondary school teachers under the study possess a high perception regarding the impact of anthropogenic global warming on environment. Based on the perception of Higher Secondary school teachers, majority of them fall in the average category (74%) and a small proportion (10%) in the low group. This shows that majority of the teachers, with an exception of a few; do not have high perception regarding the impact of anthropogenic global warming on environment.

Since global warming is a global issue, majority of the people are familiar with this term. But, many of them do not have the proper understanding about its actual causes and impacts. Therefore, awareness of education on environment should be paramount concern of all the citizens of society. The key for achieving this goal lies in Environmental Education and its related programmes.

Table 2

Comparison of mean scores of perception of Higher Secondary School Teachers regarding the impact of anthropogenic global warming on environment based on the sub-sample – Subject (Science and Non-science), Gender and Locale

Sub-sample		No. of teachers	Mean	Standard deviation	C.R	Level of significance
Subject	Science	172	128	16.13	3.16	0.01 level
	Non-science	218	122.74	16.54		
Gender	Male	150	124.73	15.03	0.18	NS
	Female	240	124.42	17.54		
Locale	Rural	256	124.42	15.38	0.99	NS
	Urban	134	126.25	18.22		

Analysis and interpretation of results obtained from Table 1.2

By comparing of mean scores of perception of science and non-science teachers regarding the impact of anthropogenic global warming on environment, it was found that the obtained critical ratio 3.16 is significant at 0.01 levels ($P<0.01$). This shows that there is a significant difference between the mean scores of perception of science and non-science teachers regarding the environmental hazards caused by the impact of anthropogenic global warming.

Compared to non-science teachers, science teachers are more familiar with environment. They get more opportunities to know more about the current environmental issues, their causes and impacts. So equal opportunities should be given to non-science teachers by conducting programmes and activities which will help them to enhance their awareness about environment and its related issues.

In the case of sub-sample gender, the obtained value of the critical ratio is 0.18 ($P>0.05$), which is not significant. This indicates that there is no significant difference between the mean scores of male and female teachers regarding the impact of anthropogenic global warming on environment.

Now a days, mass media are handling environmental issues in a astonishing way. They are giving prime importance to various environmental issues like environmental pollution, deforestation, global warming, etc. One may see an article or report in the newspaper or television channels regarding any of the current environmental issues almost every day. Along with these, there are reports about environmental activists who are talking about environmental issues. All these can help people know about various environmental issues and its causes and impacts up to a certain level. This may be the reason behind similar awareness of male and female teachers regarding the impact of anthropogenic global warming.

Comparison of mean scores of rural and urban teachers shows that the obtained value of critical ratio is 0.99 ($P>0.05$) which is not significant. This means there is no significant difference between the mean scores of teachers coming from rural areas and those coming from urban areas regarding the impact of anthropogenic global warming on environment.

During earlier times, urban people were suffering more from the adverse effects of environmental pollution than rural people. But now, due to globalisation and urbanisation, villages or rural areas are moving to metropolitan cities. This has caused the villages, which are the store house of natural resources and beauty, to change to lands with many large buildings and uncontrolled population and pollution. Hence, like that of urban people, rural people also facing environmental problems due to rapid modernisation, urbanisation, industrialisation and land use

changes. Such type of environmental issues have made rural and urban teachers understand about the impact of environmental problems like anthropogenic global warming to some extent.

Table 3
Comparison of mean scores of perception of government, aided and unaided Higher Secondary school teachers regarding the impact of anthropogenic global warming on environment

Source of variation	Some of squares	df	Mean square variance	F- value
Between groups	Sb2 = 557.84	2	278.92	1.1
Within groups	Sw2 = 97961.4	387	253.13	

The F-value table is referred for 2 degrees of freedom for smaller mean square variance on the left-hand side, and 387 degrees of freedom for greater mean square variance across the top. The critical values of F obtained by interpretation are as follows.

Critical ratio of F = 3.03 at 0.05 level

Critical ratio of F = 4.68 at 0.01 level

The computed value of F is 1.1 is lower than both the critical values of F at 0.05 and 0.01 level of significance. Hence, it should be taken as 'not significant'. Therefore, no significant difference exists among government, aided and unaided Higher Secondary school teachers regarding the environmental impact of anthropogenic global warming.

This is an era of competition. There are competitions in all the fields including the educational field. There are so many self-financing and aided educational institutions which are competing with each other to provide better facilities and thereby better results. For this purpose, all the educational institutions are competing with each other to select the most qualified teachers with a high academic performance. So irrespective of the type of management, all the teachers have more or less similar awareness levels.

Tenability of hypothesis

The hypothesis formulated in this context, viz., that there will be a significant difference in the mean scores of perception of science and non-science teachers on the impact of anthropogenic global warming on environment was accepted and in the case of gender, locale and type of management it was rejected.

Conclusion

The main objective of the study was to study the perception of Higher Secondary school teachers on the impact of anthropogenic global warming on environment and to find out whether there is a significant difference in the mean scores of

perception of Higher Secondary school teachers regarding the impact of anthropogenic global warming on environment on the basis of Subject (science and non-science), Gender, Locale and type of Management. After analysing the results of teachers' perception, it was found that only a few teachers had high awareness about the impact of anthropogenic global warming on environment. Majority of the teachers had an average awareness. It was also found that there is a significant difference between the mean scores of perception of Higher Secondary school teachers on the basis of subject and there is no significant difference between the mean scores of perception of Higher Secondary school teachers on the basis of gender, locale and type of management.

The human population is rising day by day. The uncontrolled human activities are damaging the healthy environment more and more. Anthropogenic global warming can be minimised to a great extent if the causes, which are mostly human made are eliminated. Today, actions are occurring at every level to reduce, avoid, and better understand the risks associated with anthropogenic global warming. It is high time that we take actions for controlling anthropogenic global warming. As good citizens, we can play a vital role in creating a better environment for the future. It could be a small step like planting trees in more areas or keeping our vehicle exhaust smoke to the minimum or practicing 3Rs — Reduce, Reuse, Recycle, etc. So let us do our bit to control anthropogenic global warming and to create a clear environment. That is the best thing we can leave behind for our future generation.

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From Community Participation to Community Engagement

The Call for School Leadership in the Indian Context

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Abstract

Community participation in the Indian education system has largely been operationalised and studied through formal structures, which also forms a part of much of the documented literature. The existence of formal structures based on the community, such as the village education committees, parent-teacher associations, mother-teacher associations, school management development committees, etc., are linked with the larger government policy of decentralisation for encouraging local governance and enabling school-based management. Community participation, through these formal structures, has come to be viewed as synonymous with the functioning or non-functioning of these committees rather than studying the practices of the stakeholders involved, including the school head. While discussing school-community relations in the Indian context, the school as an entity has often subsumed the role of the head of the school and does not explicitly put focus on the behaviour exhibited or practices initiated by them. This paper proposes a shift in the way we perceive community participation and relooks at its key purpose which is to involve the parents and the community with the learning development of the child and be a valuable resource to the school. Drawing from studies on school leadership which study the behaviour and practices of the heads of schools in engineering meaningful community engagement, the paper attempts to position the role of the school head in the framework of School Leadership in the national policy discourse. This re-focus on the agency of the school head as a leader can be useful in bringing the school and community together, keeping the child at the centre.

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Introduction

The school and community have often been studied as separate entities, even though there exists an organic relationship between the two. Educationists and practitioners argue that 'those closest to the schools are in a better position to make responsive and relevant decisions about how teachers, headmasters and schools should operate to best serve the needs of local children'(Chapman et al., 2002). Community participation is considered as an important vehicle for promoting education, especially girl's education (UNICEF 1992), bringing together different stakeholders for problem solving and decision making (Talbot and Verrinder as quoted in Aref 2010), garnering support for educational planning and development (Cole as quoted in Aref 2010) and promoting quality of life. In the Indian scenario too, community participation has been used as an effective strategy to increase participation of children in schools, reduce drop outs and improve school functioning (Govinda and Bandyopadhyay 2010). Successful community participation has contributed to overall quality of education, improve educational access, help find solutions to many of the local challenges, build ownership of school among people, reach disadvantaged groups and mobilise additional resources through different programmes and raise awareness for educational change (Noronha 2003, Pailwar and Mahajan 2005).

In the context of school leadership, a number of researches exist that have highlighted the role and agency of school head in enabling school-community relations (Epstein 2002, Lopez 2003, Bryk and Schneider 2004, Chrzanowski et al., 2010, Khalifa 2012, Barr and Saltmarsh 2014). The role of school head has been considered as central for initiating practices that can strengthen ties between school teachers and staff and the communities that surround them (Fullan 2000). It is said that leaders of most successful schools which host children from diverse and disadvantaged backgrounds continuously engage with and are trusted by schools, parents and wider community (Hargreaves and Flink 2006). These school heads also try to improve achievement and well-being of children by becoming more involved with multiple partners of the community and help build their ownership and accountability in the school. They also act as agents to create meaningful spaces for parental involvement in school that helps improve retention and transition to higher classes, better attendance in school, improved behaviour and social skills of children (Leithwood and Seashore-Louis 2012).

In India, several government initiatives have attempted to promote community participation in school processes largely through constitution of formal school-based management structures within the framework of decentralisation of educational governance. For instance, as a uniform practice, the Centrally Sponsored Schemes of Sarva Shiksha

Abhiyan (SSA)[1] and Rashtriya Madhyamik Shiksha Abhiyan (RMSA) 2009[2] enabled the constitution of School Management Committees (SMCs) at the elementary level and School Development Management Committees (SDMCs) at the secondary level of schools that function variably in different locations. However, the mere presence of these formal structures have not been an indicator of the degree of involvement of community members, in terms of either their participation, contribution of their ideas or their say in the decision-making process within the school. In order to revitalise these formal structures and involve the community more organically with school processes, the need is to move beyond the normative structures and think creatively on how community can be brought closer to the school. This shift from community participation to community engagement calls upon the school head to formulate practices that create spaces for the community to interact and become equal partners in decision-making of the school. This paper argues that community participation in education needs to be studied not just through functioning of formal school-based management structures within the framework of decentralisation but also as a more dynamic, practice-oriented engagement with the community spearheaded by the school head and their team.

The paper begins with situating community participation in the framework of decentralisation, with particular reference to educational governance. Here, community was seen as a vehicle for improving many aspects of school functioning and for this a number of school and community-based programmes were initiated by the government and non-government sector in India. Some of these programmes were *Shiksha Karmi* project (1987), *Lok Jumbish* project (1992) and the *Janshala* programme (1998). Many of these initiatives were sporadic but with the launch of Centrally Sponsored Schemes, such as SSA and RMSA, a unified formal school-based management structure in the form of SMC/SDMC was institutionalised that sought to increase the accountability of community in school. However, a review of functioning of SMCs and SDMCs revealed that the lack of focus on the agency of individual members became secondary to the structural mandates of these committees thus limiting their effectiveness on the ground. Building on this, the paper draws on findings of various studies that discuss the role of a school head as an initiator of practices who attempts to involve the community and parents more organically with school processes as well as with the learning needs of children.

The last section describes in brief the rationale behind the National Programme Design and Curriculum Framework (NPDCF) on School Leadership Development which was developed by the National Centre for

[1] *Sarva Shiksha Abhiyan* (SSA) was launched as a centrally sponsored scheme of GoI to universalise elementary education across the country in 2001.

[2] *Rashtriya Madhyamik Shiksha Abhiyan* (RMSA) was launched as a centrally sponsored scheme of GoI to universalise secondary education in 2009.

School Leadership (NCSL)[3] and its relevance to the theme of this paper. A discussion on NPDCF brings out the current thinking on the practitioner-centric approach on school leadership development to building school-community relations in the Indian policy discourse. The NPDCF adopts a practitioner-centric approach to leadership development with the belief that school heads need to build on knowledge, skills and behaviours to be able to lead school transformation. The programmes based on NPDCF centering on leading partnerships with the community emphasise building a repertoire of skills and practices which can help the school heads and their teams to prepare action strategies for involving multiple partners of the community in many aspects of school transformation. With this as the background, the paper towards the end also puts forth potential entry points for the role of an emerging school leader in the context of engaging the community with the school.

Community Participation in the National Policy Discourse

In the context of democratic governance, the process of decentralisation has been hailed as an important milestone for initiating local participation of people. It is argued that through decentralisation '... the local government has the potential to evolve democratically because the decentralisation process allows for more responsiveness, representation, and local participation' (Fitriah 2010). The notion for 'empowering' the community and seeking their active participation was enshrined in Article 40 of the Indian Constitution which aimed for local self-governance. This got further teeth with the 73rd and 74th Amendment Act (1992–93) which required the states to legislate a three-tier structure at district, block and village level. The 73rd and 74th Amendment Acts provided for decentralisation of powers and responsibilities to the Panchayati Raj[4] institutions (PRIs) (Singh and Mor 2013). Within the broader policy framework for strengthening of local self-governance and involvement of community, these Acts made the democratic election of local bodies at the village, block and district levels mandatory. Through these acts, it became obligatory for state governments to adopt a decentralised structure of administration, across various departments be it agriculture, health, education or social welfare.

In the educational policy framework, the discussion on educational governance started as early as 1960s, when the Education Commission Report (GoI 1966) had recommended the involvement of communities with the school processes. This was followed by the recommendation of National Policy on Education (NPE) (GoI 1986) which strengthened the case for empowering communities for management of educational institutions at the local level within

[3] National University of Educational Planning and Administration (NUEPA), New Delhi in 2012 as a specialised Centre with the mandate of building school leadership capacities of school heads of the government and government aided sector by the Government of India (GoI).

[4] *Panchayati Raj* is a system of local self-governance with three tiers- the village, block and the district. It is called a *Panchayat* at the village level.

the framework of decentralisation. For this purpose, NPE visualised direct community involvement in elementary schools in the form of Village Education Committees (VECs). The Programme of Action (POA) (GoI 1992) which detailed out the operationalisation of the recommendations of NPE explicitly laid down the guidelines regarding the constitution of VEC and articulated the accountability of school heads to the VEC. The VEC constituted of 15 members with representatives drawn from parents, women, scheduled castes or scheduled tribes, minorities and functionaries of local bodies to oversee the management of all educational programmes in the village. The head of the school was the ex-officio member and convener of the Village Education Committee. Consequently, the POA also envisaged the role of the VEC as a decentralised mechanism for operationalising micro-planning and school-mapping exercises at the village level, involving villagers and parents.

The NPE thus emphasised both parental and community involvement in educational management. Since then a substantial volume of experience in the field exists with respect to involvement of community in the management of elementary education in different states of India. These initiatives in the education sector heralded an era of decentralisation in educational governance, which subsequently took shape of school-based management, through setting up of committees involving both school functionaries and community members. School-based management was one of the highlights of SSA with its mission to achieve the target of universalisation of elementary education. In fact, SSA focussed on inclusion and participation of children from the scheduled castes or scheduled tribes, minority groups, urban deprived children and children with special needs in the educational process.

For this, the representatives of these marginalised groups were given due representation in the constitution of SMCs. The enactment of Right to Education Act[5] (RtE 2009) further mandated the establishment of SMC in each school involving parents and other community members for improving the quality in education. In essence, community participation within the framework of decentralisation of school education meant the gradual shifting of powers from the central authority to the school level for strengthening of local self-governance.

Functioning of Formal School-based Management Structures: Scope and Limitations

A number of these national- and state-level initiatives attempted to build community participation into the educational process, both within the sphere of mandated school-based structures as also outside the scope of formal structures. The impact of the committees was seen the most on improving access and schooling participation of children in many parts of the country. Drawings from various practices across the country (Govinda and Bandyopadhyay 2010) highlighted the roles of different agencies like the VECs, Parent Teacher Associations

[5] The Right of Children to Free and Compulsory Education Act passed by the Indian Parliament in 2009 ensures free and compulsory education to children between the age group of 6 and 14 years of age.

(PTAs) and Mother Teacher Associations (MTAs) in improving quality of school education. In many states, it was found that VECs were involved in a variety of activities ranging from counselling of parents, organising fairs and other community events for raising awareness and driving change. In some states, VECs were also responsible for mobilising and utilising funds available from the government as well as from other sources. Other states, such as Andhra Pradesh took initiatives like the *Chaduvula Panduga* (festival of education) and *Janmabhumi Programme* which involved community members, parents and teachers on a large scale. Advocacy campaigns in Madhya Pradesh and Assam were implemented to promote local participation in school education. These initiatives had led to a significant increase in student enrolment and in a reduction in dropout rates (ibid.). Along with these initiatives, in some states, the role of motivator groups, such as *Sahayoginis* in Maharashtra and *Mahila Samata* in Andhra Pradesh were also reported to be significant in promoting women's education.

In Bihar and Karnataka, the VECs involved members of the community and PRIs within the ambit of basic education projects. In some places like in Madhya Pradesh, even teacher employment was delegated to the PRIs. The education guarantee scheme and the alternative school scheme in Madhya Pradesh saw a different approach to setting up of schools, where the local community demanded opening of schools and ensured that the schools followed minimum norms (Govinda 2003). The communitisation of public services in Nagaland was also a step towards increasing community's ownership of school, making teachers more accountable towards people and schools more efficient in their functioning. Hence, forms of community participation in education varied from appointment of community members on bodies, such as the VECs, PTAs, MTAs, SMCs and SDMCs to even complete ownership of the school by community members as part of local bodies (Govinda and Diwan 2003).

An important finding emerging from these programmes was that most of the successful initiatives mentioned above were community-led. They took the route of first engaging with multiple stakeholders around the need for education and then establishing local structures for effective participation; finally, building their capacities to contribute effectively (Chakravarty 2006). Drawing parallels between the decentralisation process in the larger policy framework and in education, Vasavi (2008) argued that states which initiated best practices in implementing the PRIs also exhibited good models for decentralising elementary education. Some of these states were Kerala, Himachal Pradesh, Haryana, Sikkim and Uttaranchal that successfully operationalised structures and processes for people to directly engage with school maintenance and functioning.

However, not everywhere one could find examples of best practices. There exist researches and evaluation studies which point to gaps in effective functioning of school-based

management committees. For instance, it was found that in a few places in Odisha, these committees became dysfunctional as there was an absence of close rapport and interaction between teachers and community and poor attendance of members in committee meetings. Many of the committee members including the president were not aware of the role and functions of the SMCs (Orissa Primary Education Programme Authority 2007, Barik 2005). In the SMCs of *Morigaon*, Assam and *Medak*, Telangana, it was found that they did not perform the functions assigned to them (Sharma et al., 2014). The teachers blamed parents for not attending meetings and parents blamed teachers for incorrect information about meeting timings. The key reasons for poor performance of school-based committees were cited as low member participation, corruption and cultural barriers, such as the caste system and political pressures.

A review of the work of SMCs through secondary data revealed that one of the critical deficits in the effective functioning of these units was the lack of role clarity among members (Ramachandran et al. 2013). Most of the members were unaware about their roles and responsibilities and ways in which they could involve themselves in the school. Lack of role clarity was also highlighted in a separate study on the functioning of SMCs in schools in Delhi which stated that though RtE 2009 was instrumental in defining the broad responsibilities of the committees, there was nothing said on the specific contribution of each member, thus creating a sense of confusion in terms of what the members were supposed to do (Sabharwal 2015).

Related with the effective functioning of school-based management committees, another important issue that deserved attention was the capacity building of community members to better utilise the decentralised powers that they now possessed. It could not be denied that in order to extend meaningful participation, community members must also exhibit certain knowledge and skills to execute these roles and functions. Under SSA, each state had some provision for capacity building programme of community members where training was imparted to a few members but was not found to be robust (Chakravarty 2006). In fact, poor quality of training programmes which were unsuitable for building capacities of members arose as a major concern in many of the researches on SMCs (Narwana 2015, Sabharwal 2015, Ramachandran et al., 2013).

It was also found that the most important activity of these committees was supervision of civil works. The committees whether at the school, village or Panchayat (village level body for local self-governance) level helped in managing midday meals, school grants and mobilisation of additional resources. Their role in improving enrolment was encouraging in a few states through initiatives, such as *Badi Baata* (an enrolment drive for attracting school going children to public schools) in Andhra Pradesh or the *Prabhat Pheri* (taking out mini processions as an enrolment drive) in Madhya Pradesh. However,

multiple case studies of selected states observed that the VECs/MTAs, PTAs and PRIs did not have the capability to conduct academic monitoring or providing academic support to the school (Ramachandran et al., 2013, Sabharwal 2015). The non-functioning of school-based management could also be attributed to the larger socio-cultural factors that had an impact not only within the school processes but also outside the school. The prevalent social exclusion of females in a village in Haryana was attributed to separate seating arrangements of boys and girls in different class sections of the school (Narwana 2015) which also reflected in less or negligible participation of women in VEC registers. There was also existence of social exclusionary practices by teachers towards students as well as social class differences between teachers and community inhibiting community participation.

Such instances signified that even though policies on decentralisation had come to view participation of community as an end-all, it did not lead to 'empowerment' of the community (Govinda and Diwan 2003, Chakravarty 2006). There is also a dearth of research on how far these administrative changes have brought reordering of hierarchical relations within the community. It still remains to be seen if these changes truly enabled sharing of power with the disadvantaged sections and those who had been traditionally outcast (Govinda and Diwan 2003). Perhaps envisaging real 'empowerment' of community to the extent of having an impact on the social structure and reversing some of the class-caste differences as an outcome of school-community relations may require a phenomenal shift in the minds and attitudes of school functionaries as well as community members.

A review of studies on functioning of SMCs or SDMCs also point to the fact that there are not many researches which show a way out in terms of what can be done to make these committees more functional except for course correction or suggest alternative mechanisms beyond the role charter prepared for these formal structures which can effectively involve the community and bring tangible results to the fore. It is here that the role of the school head is critical, as they are the focal point who can mould and build relations between the school and the community and bring the desired attitudinal change required for a closer involvement of community with each of the school functions and processes.

Role of School Leadership in Fostering Meaningful Community Engagement

The importance of school leadership behaviour and practices have been extolled in influencing student learning (Leithwood and Sun 2012) and for a host of practices that are drivers for creating meaningful relations with the community (Epstein 2002, Barr and Saltmarsh 2014, Bryk and Schneider 2004, Khalifa 2012, Lopez 2003). It is well researched that continuous and purposeful communication with the parents has an impact on self-belief and learning outcomes of the

children (Khalifa 2012, Masumoto and Brown-Welty 2009). Within this growing literature, the emphasis is on the school creating opportunities for families and communities to contribute towards their child's learning at home, volunteer for activities at school, and also champion the cause of the community to sustain long term school-community relations.

Some of these leadership behaviours and practices fall under formal structures (such as in the Indian context, we have the VECs, SMCs, SDMCs or other forums), whereas a large part of these practices can be envisioned by school heads through informal spaces that are creative as well as cost-effective in bringing family and community closer to the school and contributing to children learning. A useful and popular model proposed by Epstein (2002) situates the child at the centre, with the family, the school and the community operating as three 'overlapping spheres of influence' which serve the core purpose of supporting and facilitating child's development. This envisages a shift in perspective, wherein the school no longer moves away from its accountability of student outcomes citing family and background limitations; rather it invites the support of child's family and parents to contribute to learning and development.

All of this requires genuine and sustained practices to be initiated by the school head and their team, in order to create conditions where children feel supported and develop. Community engagement, therefore, is beyond just participation in meetings and committee proceedings, and more towards seeking involvement of parents and community in school's transformation and most importantly, in child's learning. The idea of community engagement can be operationalised including dimensions, such as the six components — parenting, communicating, volunteering, learning at home, decision-making and collaborating with the community (Epstein 2002) or high commitment to learning, principal support for enrolment, a welcoming school climate and two-way communication (Sanders 2002). Both these and many other models, based on practice-based research have a few elements in common, such as the ones which place significance on communication and promoting learning of children. It is observed that in researches on school leadership that value practices of school heads towards building relations with the family or community, the key goal of putting the child first is spelt out clearly.

There are many school leadership practices that have been lauded and found effective in engaging parents and the community with child's learning and school transformation. Some of the examples are where the schools had started reading sessions involving community members and retired school teachers. During this, the volunteers and children read and discussed plots and characters of stories and promoted writing (Epstein and Salinas 2004). An elementary school worked with parents to generate books and videos to capture their lives and experiences involving

children. Another example was where teachers and parents mutually designed home work, as an important strategy for creating opportunities for parental engagement. A school had involved families with eleventh grade students to create a career profile for themselves. As part of this project, the children interviewed a professional in the chosen field of their interest and were encouraged to think on what they would do once they graduated (ibid.). One of the important researches within the framework of Joyce Epstein's model, found two dimensions, parenting and learning at home as more effective in three sample public schools in Chicago that served children belonging to minority and low-income population (Ingram et al. 2007). This research investigated different typologies of parental involvement that could enhance student achievement in high school, especially those schools which housed at-risk student population. The first typology, parenting was found to be more prevalent and had a positive outcome on student achievement. This was gathered through a questionnaire designed with practices that parents involved themselves in, such as dropping the child to school in the morning, praising a child for schoolwork, sharing stories with the child, keeping up with rules at home and creating a reading corner at home, etc. The other dimension which scored high amongst parents related to learning at home. The practices included taking the children to zoos and museums, to the library, bringing learning materials at home, talking to teachers about expectations of completing school work, working with children on various reading, writing and number skills.

In fact, many of these practices can be employed in situations where the parents belong to low socio-economic background and have difficulty in reading and writing. The idea is to engage them in their child's learning so that children feel supported at home and participate in the school more often. If school heads are encouraged to think on these lines, the parents and community members would feel more deeply connected with the child's learning activities, despite their own perceived deficits.

The Call for School Leadership in the Indian Context: Way Forward

Decentralisation of educational governance has opened the doors for community participation in school; however, the many structures it has created seem to face limitations in functioning as well as in their purported outcomes. This is because decentralisation of school governance has not been viewed as a strategy to improve quality of education, rather, as a tool for improving enrolment, maintenance of school infrastructure, supervision of midday meal projects, etc., (Ramachandran et al. 2013). Even though each of these functions are valuable, the participation of community and parents, except for in few instances, is found to falter on many grounds, for example, poor attendance in committee meetings, lack of awareness, non-clarity of roles and apathy from school and teachers.

There can be various ways in which functioning of SMCs or SDMCs can be streamlined and made useful. But, it is important that for each of the functions, there is a clear indication of how being part of decision-making will benefit the school and the child. The lack of this could be why the functioning of formal structures of school community partnership lags behind. Perhaps, the issues that are central to the functioning of SMCs or SMDCs do not resonate well with parents and community (who are part of these committees), such as overseeing utilisation of funds or providing support in the preparation of school development plan. These functions require knowledge of rules and processes, role clarity and expertise from the parents' side as well as the community. It also presumes that all members are literate and would understand the nuances of these complicated functions, which is mostly not the case.

While all these functions are connected with the development of school and children, they might not be perceived as being directly connected with the interests of the child. It is equally important for the school management committees and the school teams to involve the parents and the community with the learning graph of their children, discuss the learning needs of children and devise interesting and simple strategies by which parents and the larger community can contribute in enhancing learning levels of children. Once the communication around the goals is made clear, it becomes easier for the community and parents to associate themselves with functions of formal school-based management structures as well as be available for additional support to the school.

Some of the above concerns point towards a new paradigm for engagement of school with the community, one that is built around a practitioner's approach to School Leadership. Taking this into account with several rounds of needs-based analysis and interactions with field functionaries in states of India, NCSL had developed the NPDCF, a curriculum framework that clearly articulates a 'shift in the role of leadership that goes beyond administrative and managerial responsibilities to proactive practices for school transformation' (Diwan et al. 2015, p. 1). One of the key curricular areas of the NPDCF relevant to the theme of this paper focusses on leading partnerships that focusses, '… on the need for developing meaningful relationships between school and parents, community members, officials in education departments and other schools in the neighbourhood. The purpose is to enable school leaders to skillfully create opportunities for establishing partnerships with multiple stakeholders' (Diwan et al. 2015, p. 22). This framework has been at the base of designing capacity-building programmes for current and prospective school leaders that urge the participants to reflect individually and brainstorm in groups, problem solve and devise strategies on how to make formal structures more proactive as well as ideate on informal practices that can be potential solutions to local

challenges. This is the methodology that is followed in transaction of all the curricular areas besides school-community partnerships, such as transforming teaching-learning processes or building and leading teams.

These programmes motivate school heads to encourage positive behaviour and attitudes from self, teachers, staff and students towards the community to seek their support (see Diwan et al. 2014 and Subitha GV and Malik 2016). The themes covered in the curricular key area of Leading Partnerships cover a wide range of school-community interface. It begins with a session which is developed around identifying stakeholders and partnering with them on specific challenges that are peculiar in the Indian context. These challenges are, for example, girls staying back at home to look after siblings while parents go to work, dispute between an SMC and school staff, inadequate number of teachers in school or dealing with slow learners. The participants are asked to brainstorm in small groups on the potential stakeholders and the community from where they would involve them for each of the challenges and how they they engage them. The responses are collated into clearly articulated action steps for a building relationship with the concerned partners from the community (Diwan et al. 2014).

The next session is based on home school partnership which employs the method of discussion around reading of real life case studies in small groups. Through this method, the participants are encouraged to reflect on their own contexts and spell out challenges of their schools in order to collaboratively design strategies for bringing home and school together (ibid.). In addition, there are sessions aimed at revitalising formal school-community structures, such as the SMC, by once again focussing on building communication and problem solving skills and simulation exercises. Hence, the significant contribution of this curriculum framework lies in the fact that it opens an array of entry points for the school heads to approach the community and parents for building meaningful relations with them. This happens when the school heads develop the ability to match school challenges with the identification of right stakeholders, build on communication skills, learn to state clear purposes around a challenge or design an innovation where they seek the support of community or parents, solve problems and find strategies that are simple and actionable to arrive at a solution. This helps them to build a clear roadmap for engaging with the community around what they can really and actually contribute and not entirely based on roles that are structurally defined in mandates of SMCs or SMDCs.

Conclusion

Community participation in education in India has traversed a long distance beginning from decentralisation of educational governance. This process brought with itself the constitution of VECs/SMCs/SDMCs that were helpful

in improving educational access and functioning of schools but with limited success. These committees have involved the participation of community members and parents of children but their role is confined to supervision of school-related functions and in preparation of school development plans, much less in academic monitoring or contributing in actual learning and development of children. This paper has argued that there is a need to view community participation as a process that is rested on practices of school heads rather than as an isolated exercise where community members are expected to participate in formal committee meetings without much understanding of roles and their contribution to school processes. In order to engage the community more meaningfully, the school heads and teachers or staff need to be proactive and think of creative and context-specific strategies for bringing the school and community together (Diwan et al., 2014 and Subitha GV and Malik 2016). For this, school leadership as a practice-oriented field can offer various entry points as an aid to school heads and their teams to state clear purposes for community and parental engagement and collaboratively achieve tangible outcomes, be it for school improvement at large or instilling academic co-ownership of children in both schools and community.

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Book Review

Drought But Why?

How India can Fight the Scourge by Abandoning Drought Relief

Author: Richard Mahapatra and Snigdha Das
Publisher: Centre for Science and Environment, New Delhi
Year: 2017; **Pages:** 126
Price: ₹240

With its four chapters the book presents the repeated blunders committed in the name of urbanisation, modernisation, development and growth. This book addresses the man-made nature of droughts and the misleading and faulty drought relief measures of the government which have caused irreparable damage to the environment. Sunita Narain in the foreword of the book writes—"The fact is that urban areas and industrial hubs in our part of the world are now putting greater pressure on water resources. Cities across the country need more water. They are more powerful. Their elected master works overtime to course water from far, and further, away. Delhi will get water from the Tehri dam, over 300 km away in the Himalayas; Hyderabad, from Nagarjunasagar dam on the Krishna river 105 km away; Bengaluru from Cauvery, about 100 km away. Udaipur used to draw its water from Jaisalmand Lake but the lake is drying up. Yes, the modern water economy is indeed on our doorstep." The conversion of traditional water economy into a modern water economy, i.e., to become a formalised economy has not been managed well. In the traditional economy, 70% of water is consumed by agriculture and the rest is for industries and urban areas. This has now been reversed.

The first chapter—'*Three Years 500 Million Victims, and an Apoch'* explains how poor policies pushed India into one of its worst droughts ever. Illustrating from the current crisis of *Seemai Karuvelam*, Pjuliflora (in Tamil Nadu) which was introduced to afforest arid lands in South India in the nineteenth century has now become what the authors call it 'a villain'. People now want to root it out to escape from its excess consumption of water, and the court has questioned whether the tree has been scientifically proven to cause the drought. Citing the monsoon failures in the southern peninsula, the authors show evidence of water harvesting from the available monsoon rains to have served a better purpose than what our policies have done. The Bundelkhand and Marathwada region and their time of drought during the last two decades and the amount of money spent (15,000 crores and 21,000 crores, respectively) resulted in no relief to recharge the water bodies or ways and means to provide any relief to land and people. Likewise the region of Marathwada, Latur, Manwati in Uttar Pradesh and many others show how water scarcity and deficient rain played havoc in the people's life and how the government policies have resulted in perpetual failures. Interesting illustration of cow slaughter ban and its environmental impact from the state of Uttar Pradesh is cited by the authors after the new government assumed power reveals how the ecosystem and the consumer behaviours affect environment as well as economics. When the government banned cow slaughter, farmers and villages who depended on it economically suffered. Farmers could not find ways and means to maintain the old cows which could have, otherwise, been sent to slaughter houses. The authors believe that government's policies predictably go wrong and elucidate why, in the chapter.

The second chapter, '*Drought by Appointment'* reveals how India's drought prone areas are water rich. Technically flawed or unsuited structures to the terrain, wrong selection of reservoir location due to caste politics or regional affiliations are cited as one major reason for the failure of water storage systems and such systems not being implemented. The glaring example is Sakaria reservoir constructed at a cost of ₹ 5.7 crore in Heerapur village of Madhya Pradesh's Panna district was a non-starter because the gradient of the land did not slope towards the reservoir. Contrary to this is to understand how the medieval period created ponds some of which are still functional. Quoting from the village elders and former residents, the authors bring out the real politics in the creation of water bodies like dams, both big and small, check dams, etc. This chapter presents arguments of farmers, village elders, and of water management experts and economists who feel that the

water scarcity crisis and drought could have been averted or managed well as most of the drought-prone regions is water rich.

'*The Dreamer and the dream catcher*', the third chapter of the book bases its argument on the Prime Minister's dream statement on February 28, 2016 of 'doubling the income of farmers by 2022', which is not far away in a nation's future. The author convinces us to believe that this has evoked some hope in farmers, but not really so, for the authors give the shocking figures of farmer suicides and continual demonstrations and hunger strikes by farmers across the country. Some of these demonstrations, as we all know, resulted in shootings and killings of farmers. Moving from despair to hope, the authors now presents case studies of villages which have meticulously and painstakingly rejuvenated the recharge water and brought life back to the villages. Villages like Ralegan Siddhi in Ahmednagar district and Hiware Bazar, Kadwanchi, Satara in Maharastra and many more were able to overcome the water crisis with their traditional wisdom and modern technology. Respecting and understanding the 'nature of Nature' could be stated as one major reason for this success. Recharging during monsoon and budgeting water and not over extracting by digging borewells beyond certain depth limits are some of the timely and righteous actions which saved these villages. The authors illustrate how the incomes in these villages have increased, in some villages like Hiware Bazar many fold. This chapter also presents how effective training can improve the yield and enable farmers to be more informed. The message conveyed here is the importance of 'educating the farmer' as the subtitles goes-informed success.

The concluding chapter, attempts to capture the lessons learnt from the good and the bad practices which will yield in saving water and the earth. As the subtitle statement in the opening page states, "Indian will be polarised on the lines of who captures rain and who doesn't. In the face of climate uncertainties and lingering drought, catching water where it falls will be the religion of survival." This message needs to be inculcated in every public official, urban dwellers and villagers. A fitting quote demands notice, "Don't assume that you have inherited the world from your father and mother, but remember you have borrowed it from your sons and daughter." The authors have clearly emphasised that the drought-hit regions are water rich and every village in India can meet its water needs. The tables on pages 114 to 117 show how we can save water by practicing water management, and how the new water economy could serve the purpose of this water rich, but water starving country.

The book helps us to understand the crisis we encounter today due

to the 'mindless over use of water' and 'inefficient and faulty drought management system'. It provides direction and solutions to minimise the damage and in the long run to overcome the crisis. It proposes to 'learn from the past errors and to develop current time tested strategies of water harvesting and water recharging systems'. The book makes a significant effort to document the evidences to help us create an effective strategy for redress of the current water crisis. This book should be a prescribed book for environmental education, environmentalist, researchers, students, teachers and teacher educators in school and at the university level and would make a good reference for policymakers and environmental enthusiast.

The book has a white cover with a red text which signifies the urgency of the crisis. The tables and figures are presented aptly to refer to instantly. The book is priced very low for its rich and informative discourse and reportage from the field, making it a recommendable book for mindful engagement with our natural resources, most importantly, Water.

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