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The purpose is to provide a forum for teachers, teacher-educators, educational administrators and research workers; to encourage original and critical thinking in education through presentation of novel ideas, critical appraisals of contemporary educational problems and views and experiences on improved educational practices. The contents include thought-provoking articles by distinguished educationists, challenging discussions, analysis of educational issues and problems, book reviews and other features.

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# JOURNAL OF INDIAN EDUCATION

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## EDITOR'S NOTE

Student teacher and teaching-learning process including curriculum, pedagogy and assessment are major components of an education system. The education system does not function in isolation from society, and our social setting presents a number of challenges, which must be addressed by the education system. The present issue of *Journal of Indian Education* presents articles and papers reflecting upon various components, issues and concerns of our education system.

Studies reveal that children's understanding of concepts in the discipline of social science occupies a relatively neglected area of research as compared to other disciplines. Charu Sharma in her paper attempts to critically review and analyse the theoretical frameworks and research studies on children's understanding on the theme of nation, based on developmental psychology perspective, political socialisation perspective and new social studies of childhood perspective.

In recent past, the concept of inclusiveness has gained prominence in India as well, including the education system, in cognisance of the absence of social inclusion in Indian society which denies equal opportunities to all sections of society. Our Constitution guarantees equal opportunities to all citizens including education. However, it is still not seen in reality in the Indian society despite concerted efforts made by the nation. Malli Gandhi in his research paper raises a concern for providing quality education to a socially marginalised group of our society namely Denotified Tribes in Andhra Pradesh by analysing their socio-cultural context and constraints in availing equal educational opportunities. On a similar note, Deepti Srivastava in her paper narrates the experiences of a disadvantaged child studying in an elite school, from the dimensions of time, space and relation. The study reveals how the marginalised children's socio-cultural grouping limits access to opportunities that are available in a school.

Deviating from the issue of equity and social justice, Ravi Bhatia illustrates how our ancient systems of learning are undermined by the so-called 'modern education system' which has failed to appreciate the role of indigenous ways of learning/living. The paper highlights that the traditional knowledge systems need to be revived.

As teachers play a pivotal role in the education process, a few articles in the current issue illustrate some experiments conducted by teachers which may provide directions to teachers in enhancing the teaching-learning process. Ramesh

Dhar Dwivedi attempts to investigate the effectiveness of Inquiry Training Method in teaching Science at secondary school level.

Vijayan K. explains reasons for poor performance in Mathematics among secondary level students on the basis of an action research conducted during a three month field work at Central School for Tibetans. Lavalesh Pratap Singh and Adya Shakti Rai reported low level of proficiency in the use of Abacus by visually-challenged students for learning high order mathematical operations. The study reports lack of teacher training in this regard. Sukhvinder and Asha KVD Kamath investigated map-reading skills among Class X students. They reported that some map-based activities designed as a part of the study were found effective in developing map-reading skills among students.

In another article, Jaya Singh advocates the use of activity-based pedagogy to ensure participation of all students in learning process. The paper also elaborates on pilot testing of two activity-based modules prepared for teaching social sciences at secondary levels.

Astha Saxena and Alka Behari elaborate in their research paper that ethical issues do occupy a space in science textbooks but there is little scope for reflection and deliberation of ethical understanding of such issues. The study further reveals lack of preparedness among Biology teachers to address such issues.

Madhulika S. Patel and Saroj Pandey present the findings of a research conducted to study secondary level teacher education programmes in Sikkim. They reported that the existing pre-service teacher education programme of Sikkim needs to be revisited as per NCFTE 2009 guidelines.

The issue concludes with the review of Alan McLean's book, *Motivating Every Learner* done by Ruchi Shukla, wherein the author proposes some specific teaching styles for the teachers to help motivate every pupil in classroom and school to learn.

*Academic Editor*

# Children's Understanding of 'Nation' Theoretical Perspectives

CHARU SHARMA\*

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## Abstract

*In this paper, "nation" has been identified as one of the core and overarching themes which underlie the different academic boundaries of social sciences in school curriculum. The theme of nation takes the form of nation-states, historical or cultural communities, and counties or smaller geographical territories in the academic subjects of political science, history and geography respectively. Nation can be considered as an important theme to be investigated with children as they tend to learn about their own nation quite early in life through various direct and indirect sources. Moreover, the theme of nation may manifest in the form of nationality, nationalism, national attitudes, national identity and even citizenship, depending upon the socio-cultural context of a particular study with children. The paper attempts to critically review and analyse the theoretical frameworks and research studies on children's understanding on the theme of nation. It aims to present different perspectives under which the researches on children's conceptualisation of nation have been undertaken by scholars across the world. The theoretical orientations accompanying research studies include developmental psychology perspective, political socialisation perspective and "new" social studies of childhood perspective. It will highlight how children's understanding of nation develops and changes through the course of childhood, keeping their diverse socio-cultural contexts into consideration.*

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## Introduction

Children's understanding of concepts in the discipline of social science has

remained a relatively neglected area of research as compared to the disciplines of science and mathematics

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over the past decades across the world. The few researches undertaken in children's representation of concepts in social sciences have largely been conducted in western contexts. In India, social science as an academic discipline has traditionally been divided into strict academic subjects of history, geography, civics (or political science), economics and sociology for school-going children. It is argued that children's understanding of concepts in the social science discipline could be an interesting, yet less explored area particularly in the Indian socio-cultural context. Considering the fact that a wide range of concepts is present in different academic subjects within the social science discipline, it is a challenging task to identify specific and significant concepts for inquiring into children's developmental understanding. In this paper, 'nation' has been identified as one of the core and encompassing themes which covers the different academic branches of social sciences in school curriculum.

The term 'nation' refers to a named human community occupying a territory with common history and culture along with shared values, traditions, customs, practices and symbols (Smith, 2001). The emergence of nations and nationalism is a historically recent phenomenon in world history, as a consequence

of modernisation and industrialisation, which disrupted the traditional agrarian societies (Gellner, 1983). At school level, the theme of nation may take the form of nation-states, historical or cultural communities, and counties or smaller geographical territories in the academic subjects of political science, history and geography respectively. Moreover, the theme of nation may manifest in the form of nationality, nationalism, national attitudes, national identity and even citizenship depending upon the socio-cultural context of a particular study.

In developmental psychology, childhood is traditionally considered as a time of 'structured becoming', a phase defined as preparatory time to acquire the behaviours, attitudes and values of the adult world. However, this traditional developmental psychology view on children has been accused of seeing children as 'human becomings, not beings' by researchers working in the 'new' social studies of childhood paradigm – a recent inter-disciplinary perspective which considers children as active and competent participants (James & Prout, 1997). Nation can be considered as an important theme to be investigated with children as they tend to learn about their own nation quite early in life through various direct and indirect sources. Children's identification with a



particular nation is often regarded as an unconscious feeling that seeps into a child's core being as s/he grows up. Children's beliefs about their own nation are often associated with strong emotions which appear to be present prior to the child's acquisition of any factual knowledge or understanding on nations (Barrett, 2007). However, some scholars, including political scientists (Berti, 2005) believe that the idea of nation is neither instinctive nor natural in children but it is consciously developed in them by various socialisation agencies such as family, school, media and the like. Scourfield et al (2006) argued that the schools within national systems of education hold one of the most dominant and significant status as they equip young children with the idea of their 'nation' through school curriculum, textbooks, pedagogy, discourses and school ethos. It can be asserted that the role of schools, particularly social science curriculum, is inevitable in children's representation of nation.

In this paper, a review of the theoretical frameworks and research studies on children's understanding on the theme of nation has been undertaken. The paper aims to present different perspectives under which the research studies on the children's conceptualisation of nation have been conducted by

scholars across the world. The theoretical orientations/approaches accompanying research studies include developmental psychology perspective, political socialisation perspective and "new" social studies of childhood perspective. The paper intends to analyse significant research studies which have been carried out by scholars in these frameworks over the past few decades. The paper highlights how the children's understanding of nation develops and changes through the course of childhood keeping their diverse socio-cultural contexts into consideration.

### **Developmental Psychology Perspective**

In this section, a review of the theories on children's identification with nation, as proposed by researchers working under the perspective of developmental and social psychology has been undertaken. Developmental psychologists have been drawn to the field of children's identification with nations and national groups, as a way of theorising and testing specific theories that have been proposed within the domains of developmental and social psychology. Some social psychological theories have been suggested to explain how preferences for social groups, including national groups, develop through childhood which can be

extrapolated to the study of children's understanding of nation. These theories are Piaget and Weil's stage theory, social identity theory, cognitive developmental theory and societal social cognitive motivational theory. These theories focus on different aspects of the theme of nation as idea of country or homeland, national affiliation and attitudes towards nations, with children as discussed in the following section.

### **Piaget and Weil's Stage Theory**

In a classic study on children's development of the idea of homeland, Piaget and Weil (1951) theorised a stage-wise development of the concept of nation among children. They applied the method of survey to collect data on a large number of children between 4-15 years in Geneva. Piaget and Weil postulated that children presuppose a parallel process of cognitive and affective development through gradual realisation that they belong to a particular country. In the first stage, prior to 7-8 years, children lacked an understanding of both spatial-geographical inclusion relationships and conceptual inclusion relationships. During the second stage, between 7-8 and 10-11 years of age, the children mastered spatial-geographical inclusion relationships, but still could not understand conceptual inclusion relationships. In the third stage,

from 10-11 years of age onwards, the children finally mastered conceptual inclusion relationships as well. Piaget and Weil hypothesised that before children attain a cognitive and affective awareness of their own country, they made a considerable effort towards decentration (i.e., broadening of their centres of interest) and integration with their surroundings.

The three stages described by Piaget and Weil correspond to affective evaluations in a clearly marked process of decentration, starting motives essentially with subjective or personal impressions and progressing towards acceptance of the values common to the larger social group. This theory proposes that children's cognitive functioning is domain-general rather than domain-specific which implies that at any given point in development, the child's cognitive performance is not task-specific but is relatively homogeneous, being structurally equivalent across a range of different knowledge domains. Thus, the child's thinking in any particular domain is rooted in deeper, domain-general, cognitive structures, and it is the changes that occur to these underlying structures that derive the development of the child's thinking in different domains. These deeper structures change themselves as the child learns from his or her personal experiences in the world, with the

driving force behind these changes being the child's need to achieve cognitive equilibrium (Piaget and Weil, 1951).

### **Social Identity Theory**

Tajfel (1967) conducted a series of cross-national studies on the development of national affiliations by children between 6 to 11 years using large-scale surveys in seven European nations — England, Scotland, Belgium, Holland, Austria, Italy and Israel. In one such cross-national study, it was found that children displayed highly significant preference for their own national groups as compared to other national groups. However, this finding did not apply when a national or ethnic sub-group is traditionally less clearly identified with the nation-state by children. Moreover, there was a direct relation between the children's system of preference of other nations based on their perceptions of its similarity with their own national group. Another similar study by Tajfel involved children in taking concrete decisions on specific situations for nationals of their own and other countries. Two general bases for their justifications were discovered—a patriotic preference for their own country and a general norm of fairness. The study found that children's preferences and their capacity to perceive relations among

national groups may involve a reasonable norm of fairness, other than preference of their own national group (Tajfel, 1967).

Later, Social Identity Theory was proposed by Tajfel and Turner (1986) on the development of identity among individuals, including children, on the basis of their social groups. Social identity theory is based on the observation that children belong to many different social groups such as gender, national, state, ethnic and social class which may be internalised as part of a child's self concept. In order to do this, the in-group (i.e., the child's own nation) is compared against out-groups (i.e., other nations) using dimensions of comparison. While constructing representations of in-groups and out-groups, dimensions of comparison are selected that produce more favourable representations of in-groups than of out-groups. Therefore, it implies that children tend to selectively learn the positive characteristics of their own nation as compared to other nations (Tajfel & Turner, 1986).

### **Cognitive Developmental Theory**

Cognitive Developmental Theory is a more recent adaptation of Piagetian theory on the development of children's national and ethnic attitudes. Aboud (2008) proposed an alternative cognitive-developmental

perspective that can be applied to the development of children's attitudes to national groups, using the technique of empirical and statistical testing based on standardised tools. Aboud suggested that children's egocentricity and affective processes dominate their responses to people from other national, ethnic and racial groups before the age of 6 years. Thus, children exhibit maximum in-group bias (i.e., favour own national groups) and negative prejudice against out-groups (i.e., dislike other national groups). Cognitive developmental theory postulated that there is a significant discontinuity in children's development of ethnic and racial prejudice at about six years of age. These biases for national groups are hypothesised to peak at 6-7 years, after which these biases decline. However, between 6-7 and 11-12 years, children increasingly attribute more negative traits to the in-group (i.e., child's own country) and more positive traits to out-groups (i.e., other national groups). These shifts are likely to be driven by the development of the child's underlying cognitive and socio-cognitive skills (Aboud, 2008).

### **Societal-Social-Cognitive-Motivational Theory**

Societal Social Cognitive Motivational Theory (SSCMT) has been developed by Martyn Barrett (2007) based on

the research evidence provided by large-scale surveys, quantitative and empirical studies with children. This theory attempts to integrate all the factors that affect children's intergroup attitudes within a single overarching framework. SSCMT begins from the observation that the child always develops within a particular societal niche characterised by specific historical, geographical, economic and political circumstances. These circumstances define the relationships between the child's in-groups (i.e., own nation) and salient out-groups (i.e., other nations) based on the history of peaceful coexistence or conflicts with other nations. From a developing child's view, the most relevant factors are parents, teachers, school curricula, textbooks and the mass media. Barrett (2007) proposed that parental discourse and actions can directly or indirectly influence their children's developing intergroup attitudes towards nations. The school influences the child's personal contact with people from other national, ethnic and racial groups. Hence, there are many sources of information about other groups available to the child, such as school curriculum, textbooks, teacher discourse, parental practices, peer group interaction and the mass media (Barrett, 2007).

To sum up developmental psychology perspective, some

theories and research studies have been conducted by focussing on different aspects of nation, such as idea of country, national affiliation and attitudes toward nations among children. During the early 1950s, Piaget and Weil theorised stage-wise progression of the idea of country and emphasised that children undergo simultaneous processes of cognitive and affective development, in gradual realisation of their belongingness to a particular country. Tajfel (1967) carried out cross-national studies on the development of national affiliations by children and highlighted that they displayed highly significant preference for their own national groups as compared to other national groups. Later, social identity theory was proposed by Tajfel to explain the development of identity among children on the basis of different social groups, including national groups. Cognitive developmental theory (Aboud, 2008) can be applied to the development of children's attitudes to nations which acknowledges the role of socialisation factors, but stresses that children's underlying cognitive abilities ultimately determine the influence of these social factors. Societal social cognitive motivational theory was proposed by Barrett (2007) that integrated all the possible cognitive, affective, social and motivational, factors that might impact on

children's intergroup attitudes towards nations. These factors include parents, teachers, school curricula, textbooks and the mass media. Barrett postulated these factors are, in turn, influenced by the child's cognitive, affective and motivational processes while developing the concept of nation. The research methods applied under these developmental psychology theories were limited to large-scale collection of data, standardised testing, quantitative analysis and generalisation of results in a stage wise or theoretical manner for all children. Moreover, these developmental psychology theories do not foreground the role and significance of the socio-cultural context for children's understanding of different aspects of nation.

### **Political Socialisation Perspective**

Political socialisation perspective refers to the processes through which a young child acquires political orientations including political knowledge, attitudes, norms, values and standards of evaluation transmitted by society - from one generation to another generation (Easton & Hess, 1962). In this section, three different waves of research will be outlined within which the development of political understanding among children will be discussed by

outlining the theoretical frameworks of the various research studies. Berti (2005) propounded research studies that addressed age-related changes among children in political attitudes and knowledge as having taken place in three distinct waves while conceptualising children's understanding of political concepts, including nation.

The first wave of research comprising empirical investigations into children's political attitudes was carried out in the 1950s and 1960s under the label 'political socialisation' (Greenstein, 1969). These investigations referred mainly to the system theory from political science, and psychoanalysis and learning theories from psychology. Easton and Hess (1962) hypothesised that the truly formative years for the development of political knowledge among children are between the ages of 3 and 13 years. By the time children are seven years old, most of them have become firmly attached to their political community. Based on a study of elementary school students in the U.S., Hess and Torney (1967) argued that the child's relationship with his country develops from a vaguely understood, though highly positive attachment to his country to a more informed emotional tie by the end of elementary school.

Easton and Hess (1962) suggested that by the time the child has

completed elementary school (i.e., at age 14), many basic political concepts, such as nation, have become firmly established. They indicated that children learn their political attitudes from their parents through observation and by modelling adult attitudes. The school appeared to have had a direct effect on children's early learning and political attitudes. Education made a difference in political learning and researchers claimed that there were linkages between school, classroom practices and political outcomes (Hess & Torney, 1967). Formal education bolstered by the mass media was likely to be the source of such political knowledge. By the time children reached second grade, around age seven, most of them have become firmly attached to their political community (Easton & Hess, 1962). Due to the large number of participants required to investigate these variables, the method frequently used was a large survey with written questionnaires, which hampered a thorough examination of children's understanding of nation.

The second wave of research in political socialisation, which took place from the 1970s to the 1980s, reflected the changes that occurred in those years both in the political climate and in the leading psychological frameworks. The different theoretical frameworks of research studies on children's

political understanding that found increased support among psychologists included Piagetian cognitive development theory, Erikson's theory on identity development and lifespan development. The methods of investigation applied were surveys and group or individual interviews with children for assessing their understanding on political concepts. Moore et al. (1985) found that before the age of 6-7 years, children do not possess the concept of nation, intended as the territory of a state, nor do they have what might be considered its rudimentary version, that is, a large territory inhabited by people who have something in common. In the American sample assessed by Moore et al. (1985), by fourth grade (around 9 years) most children were able to name correctly the city, state and country in which they lived. However, correctly naming countries or locating them on a map might not involve an understanding of what kind of entities they were. At 10-14 years, children were able to articulate their understanding on core political concepts, including nation-state (Moore et al., 1985). Such findings stimulated researchers to concentrate on the age range most represented in the ranks of political movements—late adolescence and early adulthood by regarding it as a period of major change in political

position and commitment.

The third wave of research on political socialisation during the 1990s onwards was also affected by an intertwining of current political problems, along with mainstream approaches to the study of development. Several studies (Berti, 1994, 1988) suggested that, before about 10-11 years of age, children do not know what countries, states or nations are, or that they conceive of them as physical or social categories, but not yet political entities. Italian children younger than 10-11 years were either unable to define the words state or nation, or defined them as large territories with villages, towns or cities (Berti, 1994). The full emergence of a native political theory, with the concept of the nation-state at its core, appeared to take place at about 10-11 years. They represented their respective territories as one included in the other. As a result, children could conceive of the nation-state as a territory with a central power that makes laws and whose decisions affect the whole country (Berti & Benesso, 1998). Between the ages of 12 to 16 years, there was further refinement of political understanding.

An intervention study, conducted using a domain-specific approach, highlighted the role of explicit teaching (Berti & Andriolo, 2001). A curriculum on political concepts, including nation-state, was

successfully implemented with children around eight years, in a third-grade class. After the intervention through curriculum and teaching, children knew that a state is a territory where particular laws, made by parliament, apply and that the government uses money obtained through taxes to pay the employees involved, such as teachers, police and judges. According to Berti (2005), this wave of studies has mainly been conducted in the framework of contextualist approaches such as those of Bronfenbrenner, Vygotsky, Erikson and in Europe, the theory of social representations, which all underline that children's experience of the social world is mediated by the interpretations circulating in their social communities. In these studies, to underline the difference in perspective from the first research wave, the term political 'development' is substituted for political 'socialisation'. The explicit aim of these studies has been the development of policies and educational interventions that might help foster political competence and engagement among children. Therefore, the focus of this third wave was mainly on adolescents and young adults.

In this section, a review of the researches undertaken by various scholars working under the perspective of political socialisation

was undertaken in three distinct waves of research studies. The first wave of researches in the 1950s and 1960s investigated children's political understanding with children in the age range of 5-16 years. This wave suggested that children around 14 years display many basic political concepts, such as nation. The second wave of researches began from the 1970s to the 1980s which reflected the changes of those years both in political climate but very few researches were carried out. It was reiterated that children in the age group of 10-14 years could articulate their understanding on core political concepts, including nation-state. The third wave of researches on political socialisation during the 1990s onwards was more intense and rigorous in research studies. It was influenced by current political problems with the aim to develop educational programmes to encourage political competence and engagement among children. In all the three waves of research on political socialisation, the role of socialisation agencies, particularly school, curriculum and pedagogy, have been firmly established with gradual increase in their significance over the years.

### **'New' Social Studies of Childhood Perspective**

The 'new' social studies of childhood perspective evolved during the 1990s



while accounting for children's development in various domains, including identification with nation. This perspective, sometimes also known as the 'new' sociology of childhood, stands strikingly apart from the conventional sociological tradition of understanding children pioneered by classical sociologists in the first half of the twentieth century. The 'new' social studies of childhood suggest that children are competent and active participants in all kinds of social scenarios. This perspective acknowledges children as developing beings, not human 'becomings'; but at the same time validates their agency in their everyday lives (James, Jenks & Prout, 1998). It does not have to be approached from an assumed shortfall of competence, reason or significance. The change in terminology from the sociology of childhood (James & Prout, 1997) to the new social studies of childhood (James et al., 1998) reflects a growing cross-fertilisation of ideas between researchers in a variety of social science disciplines.

The major pitfall of developmental psychology based studies is that it is not much interested in the children's own worldview because of a strict focus on cognition. These subjective dimensions of childhood are seen as constitutive of children's identity as in the 'new' sociology of childhood. The dominance of

socialisation theories, including political socialisation, in learning concepts implied that children were seen as incompetent and incomplete, it was the forces of socialisation—the family and school—which received greater attention with 'little or no time' being given to children themselves (James et al. 1998, p. 25). Brannen and O'Brien (1995) pointed out that the position was little different in British sociology, where children tended to be ignored, with children only being studied indirectly in sub-disciplinary areas such as the family or education (Scourfield et al, 2006).

In this section, a review of the research studies under the 'new' social studies of childhood conducted by several scholars since the 1990s has been undertaken primarily in a chronological manner. In a study of Irish children, Kevin Nugent (1994) examined the development of children's relationships with their country at different ages, and described the manner in which this relationship unfolded and the possible stages in its development. Content analysis of children's narratives, at different age levels—10, 12, 14 and 16 years, suggested that the relation of the child to her/his country is a developmental phenomenon which is mediated by cognitive processes. However, he observed that the affective quality of the child's attachment to her/his

country is influenced by the cultural-historical and political milieu in which it emerges and develops. The study indicated a strong relationship between Piaget's stage of formal operations and Erikson's stage of identity achievement and the development of the highest levels of national perspectivism in children (Nugent, 1994, p. 288).

In a classic study of children belonging to three different nations, Hengst (1997) focused on the development of national identity in children. He conducted guideline interviews with children in the age group 8-13 years across the three countries. Hengst found that there were differences between the groups studied in relation to the importance they assigned to national identity. There was also evidence that children, in many cases, saw themselves as more similar to other children across nationalities than to adults who shared their nationality. He suggested a phrase 'children's international' which pointed out the role played by globalised media, entertainment and consumer industries in establishing a 'basis of global solidarity' (Hengst, 1997, p. 58).

While researching on the engagement of children on the theme of nationalism in a conflicting area, such as a Palestinian refugee camp in Jordan, Hart (2002) undertook ethnographic fieldwork with children. In their position of marginality to

both the Jordanian nation-state and the emerging Palestinian national entity, the children of Hussein Camp became the objects of different visions for their own collective future. However, the principal focus was upon children as they engaged with the discourses presented to them within a particular spatial and historical context. The young children in Hussein Camp might be considered as 'deviant' according to the criteria argued by Stephens (1997). The national identity of these children became ambiguous and potentially multiple, far from fitting into any single mould. In this setting, they automatically acquired the status of both UN registered refugees and citizens of the Jordanian state. In conducting ethnographic enquiry into such subjects, Hart (2002) suggested attention should be provided to the experiences and activities of young children, who reshape the complex and frequently contradictory cultural politics that inform their daily lives (Hart, 2002).

To sum up 'new' social studies of childhood perspective, it is important to reiterate that it emerged as an alternative to the theoretical orientations of developmental psychology and socialisation theories, including political socialisation perspective. It considered children as active and competent participants by validating their agency in everyday lives. In this

section, a review of studies from the 1990s to the recent times which followed this perspective was being undertaken. From these studies, it becomes evident that national identity has become the focus of researches with children. The objectives, methods and findings on national identity have been centred on children themselves, rather than arriving at pre-determined criteria through cognitive stages of developmental psychology perspective or locating the role of socialisation agencies of political socialisation perspective. Among the significant findings of this perspective, children's relationship with their country is a developmental phenomenon, mediated by cognitive processes but influenced by the child's socio-cultural, historical and political milieu. Many researchers have concluded that children had begun to adopt new forms of national identity that involve a constant movement between the national and the international aspects of identity. In some researches, the exposure to a globalised world through mass media, migration and tourism has been identified as children's construction of national identity. It also emerged from some studies that children's responses in different social-cultural contexts rarely had cultural or racist overtones. Few studies demonstrated the willingness of children to engage in critical

reflection on their constructions and negotiation of national identity.

### **Emerging Concerns in the Study of Nation in Indian Socio-Cultural Context**

India is a nation with plural and diverse society varying in terms of religion, culture, language, regions, traditions, customs and rituals. There are some characteristics that make Indian society pluralistic, according to criteria developed by Ainslie Embree (1972). First, the different regions or states in India have relatively autonomous existences which imply that there is no single dominant common way of life. Second, the regional groups have different lifestyles which include differences in language, religion, culture, food and customs. Third, there is relativism in cultural and moral choices with no common vision of what is "ideal" for people. Such characteristics have been present in Indian society throughout history, and are no less present today, and their presence is the key to an understanding of India as a pluralistic nation. Sunil Khilnani (2012) argues that the 'idea of India' is not homogenous and univocal as no single idea can possibly capture the many energies, angers and hopes of all Indians. The Indian idea has itself become a proudly plural idea. It is the capacity of India's representational and constitutional

democracy to articulate India's diversity by giving voice to differing interests and ideas of self, rather than merely to aggregate common identities.

In India, immense diversities are reflected in various castes, religious and linguistic groups, each having its rituals, customs and practices. India is a socialist and secular nation, as mandated by the constitution, which guarantees that people belonging to diverse regions, religions, cultures, languages and socio-economic strata should be treated as equal. National integrity has been maintained even though many social, political and economic inequalities have obstructed the emergence of egalitarian social relations. The cohesiveness of India is inherent in its historical, social and political realities as well as in its cultural heritage. In India, there has been a continuous unity even in the greatest diversities. Therefore, India is a plural society characterised by 'unity in diversity' with synthesis of different cultures, religions and languages of people belonging to different castes, communities and minorities. Shalini Advani (2009) articulates the role of education system in construing nation for school children in two distinct ways—through the constitution with a national-cultural imagery which locates the nation in the realm of loyalty and through a description

of the nation in social progress.

The theme of nation, therefore, cannot be understood as a homogenised entity due to the extreme diversities in Indian pluralistic society. However, nation can be a very significant and interesting area to be explored with children. Most children in the age-group of 6 to 14 years attend formal or informal schools. Children gradually learn the concepts, including nation, from the social science textbooks followed in their respective schools. Some researches and reviews have been undertaken to analyse the concepts in social science textbooks, designed by NCERT, SCERT, Eklavya and others, during the past two decades. However, most of the previous researches of social science concepts have been conducted by analysing text materials but children's understanding of those concepts has not been investigated by researches.

Alex George (2004, 2007) examined the perceptions of children on *sarkar*, a concept which involves political aspects of the theme "nation". George explored children's understanding on three basic themes—the formation of an elected government, its functions and major institutions. He highlighted the "gap between the real and the ideal" for children as the school texts were extremely terse and factual which discussed only the "ideal types"

within a 'Constitution-centric' framework (2004, p. 248). These texts tended to describe government-based institutions and functions as they "ought to be" rather than in real life; which could not provide the enough space for the images children learn from the actual events. The texts failed miserably to critically evaluate and blend the ideas which children gained from their real-life experiences (George, 2004). As a result, after reading such texts, children also failed to identify the relationships between various interrelated concepts due to the lack of examples in the textbooks from the real political world in order to present a concrete picture of these concepts. George (2007) argued the need of redefining the concept of *sarkar* in the state-prescribed school textbooks for children as the ideals presented in the textbooks and images from the actual political world often do not support and sometimes contradict each other. Alternately, he suggested that the textbooks should attempt to draw a picture of the political processes as they actually take place in the milieu that surrounds the children and should identify such contradictions and cautiously discusses them, showing the tension between the ideal and the real (George, 2007, p. 67-69).

In the past decade, some scholars (Madan, 2003; Jain, 2005) have

critiqued the conceptual knowledge as provided in the social science textbooks for school children. Amman Madan (2003) criticised the prevalent social science textbooks, particularly civics, for avoiding any closer examination of the state-based functions and responsibilities. According to Madan, civics textbooks were marked by a 'distrust of local initiatives', sought to push only the 'validity of the state's actions' and ignored 'conflicts of interests' and struggle for powers among political parties. He emphasised the 'paradox of contemporary civics has been that it teaches democracy, freedom and rights in a fundamentally undemocratic way' (2003, p. 4657). In Madan's opinion, children are expected to learn the mechanism of elections, the formation of governments and sets of rules in the bureaucratic organisation of the state without any scope for discussion or debate. Moreover, children are taught that they are free, but not free to criticise or dispute what they are taught. Manish Jain (2005) criticised the use of legalistic language to present an abstract image of the state institutions in school textbooks as it becomes difficult for children to form a conceptual understanding of these structures. The "ideal" presentation of the state-based institutions could not encourage the children to find and discuss

strengths, weaknesses and contributions of these structures. He argued that NCERT's civics textbooks tend to 'distort reality, sanctify the state and strengthen the process of hegemonisation', by neglecting the growing crisis in society (2005, p. 1941).

On the basis of the critical review by many educationists on social science textbooks in the past, the recent National Curriculum Framework (NCF, 2005) recommended that 'the content needs to focus on a conceptual understanding rather than facts to be memorised for examination' (NCERT, 2005, p. 50). The NCERT's position paper on the teaching of social sciences further built the argument for improvement in conceptual knowledge by reiterating that 'concepts should be explained to the students through the lived experiences of individuals and communities ... that make up the social and cultural milieu of the child' (NCERT, 2006, p. 9). Hence, with the introduction of new textbooks of social sciences by NCERT along the lines of NCF-2005 a new ray of hope has emerged for positioning and treating subject-matter and making it stimulating, interesting and worthwhile for children, thereby enabling better concept development and understanding.

## Conclusion

In this paper, different theoretical perspectives and research studies on children's representations of nation have been critically reviewed and analysed. Developmental psychology perspective believes that children's identity with nation emerges quite early in life. This perspective includes some theories – Piaget and Weil's stage theory, social identity theory, cognitive developmental theory and societal-social-cognitive-motivational theory, which provides explanation for the development of the theme of nation. Political socialisation researchers believe that the concept of nation and nationalism emerges in children by various socialisation agencies such as family, school, media and so on. Political socialisation perspective has been discussed by elaborating three distinct waves of research studies across a wide time-frame. More recently, the perspective on "new" social studies of childhood emerged which reflects a growing cross-fertilisation of ideas in a variety of social science disciplines towards the last decade of the twentieth century. This perspective evolved in response to the growing dissatisfaction among researchers with previous perspectives on different aspects of development in children, including representation of concepts, such as nation.

Within these perspectives, the theme of nation has been conceptualised and studied through researches in varied ways. The theme of nation has been studied as idea of country or homeland, affiliation to nation and national attitudes in developmental psychology researches; as a core political concept which may take the form of nation-state in political socialisation researches; and as national identity or relationship with nation in “new” social studies of childhood researches. Consequently, the theme of nation is construed in a different manner with the help of these perspectives and subsequent researches. In developmental psychology perspective, nation has been viewed as a cognitive, social or geographical category which can be generalised in a stage-wise manner as universal phenomena. Under political socialisation perspective, nation has largely been understood as a political or civic concept. In “new” social studies of childhood perspective, nation is conceptualised as a social, political, historical, geographical, subjective and more holistic construct in the form of national identity for children.

Research methods applied under different perspectives for studying children's understanding of nation have immense differences. It is quite significant to evaluate the research methods as they can either limit or

expand the horizon of researches undertaken within those perspectives. The researches under developmental psychology and political socialisation perspectives follow the method of collecting large scale data through surveys, standardised testing or group interviews with children. The data collected on a large scale is then subjected to quantitative analysis for generalisation through stage-wise development of different aspects of nation in children. Both these perspectives tend to reduce children as “objects” of research on whom the data should be collected; but they have been criticised for generalising findings of studies conducted in Western contexts as universally applicable. The “new” social studies of childhood apply various methods - individual interviews, narrative inquiry, discourse analysis and ethnography to collect and analyse data with children depending on the context of the research. It gives prominence to children as “subjects” of research by collecting in-depth data on limited participants through qualitative methods. Therefore, it integrates diversity of research approaches with children and considers children as social actors and active participants with their set of needs, rights, individual differences and subjective dimensions.

On the criterion of giving agency to children, “new” social studies of childhood emerged as an

interdisciplinary perspective of studying 'child' as a developing 'being' – which is conceived of as a social actor or participant, who can be understood in her/his own right. The dominant developmental psychology paradigm takes away children's agency while researching and tends to view children as 'adults in the making' or 'human becomings', rather than children in the 'state of being'. Political socialisation perspective overemphasised the role of socialisation agencies by giving too much attention to the forces of socialisation, such as family and schools; thereby neglecting the active and independent participation by children in learning the concept of nation. Although some developmental psychology theories acknowledge the role of socialisation factors for children's ideas on nation, but children's own cognition of those factors was the determining parameter. On the other hand, the 'new' social studies of childhood perspective provides due importance to socialisation factors and foregrounds the social context of children.

It is significant to critically review and analyse the theoretical perspectives that are prevalent in western contexts to evolve a well informed perspective on children's representation of nation in Indian

socio-cultural context. It has been noted that some researches and reviews have been undertaken to analyse the content of social science textbooks in the past few decades. However, most of the previous researches of social science texts have analysed text materials which neglected children's understanding of specific concepts present in those texts. The study on children's perception of *sarkar* by Alex George (2007) is the sole worthwhile study which highlighted a huge gap between the "ideal" concepts present in school textbooks and the real life experiences of children. There is paucity of researches on children's representation of concepts in social sciences. Nation is one of the core and overarching themes which children learn from their social science textbooks in different academic subjects in schools. The theme of nation is studied in the form of nation-states in political science; as historical or cultural communities in history and as counties or smaller geographical territories in geography. However, the theme of nation cannot be studied as a homogenised entity in India because of its plural and diverse context. It is a very significant and interesting area to be explored in Indian socio-cultural context with children.



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# Educational Deprivation among Denotified Tribes: a Study of Andhra Pradesh

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## Abstract

*Denotified Tribes (DNTs) form a large segment of population in Indian society. They are largely characterised by extreme poverty and socio-economic backwardness. Due to several factors the DNTs remained backward educationally, socially, politically and economically. During the years of British rule, they were treated as habitual offenders and even today they are among the worst victims of cruelty and injustice particularly mob lynching, arson, public and police atrocities, mainly on account of the stigma of criminality attached to them. A majority of the DNTs are illiterate even after 65 years of Independence and are still deprived of quality education, violating both fundamental right to education enshrined in our Constitution and the basic socio-cultural human right. The DNT families are perceived to occupy the bottom rung of the socio-economic ladder, plagued by poor education and economic status.*

*The purpose of the paper is to analyse the current educational scenario of the DNT children in the settlement schools of Andhra Pradesh, their social context of education, state provisions for the education, school participation of DNT children, educational inequality, constraints to educational opportunities, and suggestions to improve the education of DNT children in Andhra Pradesh and the newly formed Telangana state.*

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## Introduction

Andhra Pradesh is one of the states with a large proportion of DNTs (59 communities with 6 per cent of the total population). Of late, there is an

increasing visibility of the DNTs in social life, the most prominent being their growing political and cultural assertion, and identity formation as habitual offenders. A large section of

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DNTs are experiencing social discrimination and stigma, particularly those located in the tradition bound and socio-economically backward regions. They are classified under different communities. Some of them are included in the list of Scheduled Tribes and others are in the list of Scheduled Castes, and some in the list of Backward Classes. There is lack of adequate information on their educational attainment, status, achievement levels, as these have not been covered reasonably during census enumeration and other surveys in the country. Only some rough population estimates for the purpose of sample surveys and estimating growth rates of population have been done so far with regard to this neglected and isolated population. Constitutional protection has to be guaranteed to them on similar lines as given to SC/STs by creating a separate Third Schedule for Denotified Tribes. They may be called Scheduled Denotified and Nomadic Tribes. They may be included in the Ninth Schedule as an independent list.

The DNTs are living in separate localities and outskirts of the villages. These places are called settlements or *tandas*. But, so far there is no settlement/*tanda* education, development schemes provided either by the State or the Central Government. Infrastructural facilities

like roads, electricity, safe drinking water, health, sanitation, education, and hostel provisions are not available in their dwelling places. Like SC/STs the government should provide provisions and budgetary allocation in the 12<sup>th</sup> Five Year Plan to the DNTs for the construction of roads, providing electricity, drinking water facility, and particularly for their education. They are living in squalour. Many of these communities have no permanent houses and schools. They are generally found only in the outskirts of the villages. Separate education schemes are very much required for these communities.

### **Current Educational Scenario of the Denotified Tribes**

According to the 2001 census report, there are 59 communities of Denotified Tribes in Andhra Pradesh and as per the Tribal Cultural Research and Training Institute, Hyderabad, Government of Andhra Pradesh (TCR & TI) survey there are 52 communities. Telangana, Coastal Andhra and Rayalaseema accounted for the largest number of DNTs among the districts. Of the total tribal population, 39 per cent of them belong to Sugali community and are dominant in Warangal, Nalgonda, Khammam, Mahaboob Nagar and Nizamabad districts. Around 9 per cent population, comprising both the Yanadi and

Yerukula communities, are predominant in Nellore, Chittoor, Prakasam, Guntur, Anantapur, Krishna, and Kurnool. The Waddar largely inhabit Kurnool and Anantapur districts.<sup>1</sup>

The problems faced by the DNTs are manifold, which are related to economic, social, cultural, school and administrative factors. Children are among the worst victims of social injustice. Extreme poverty, child labour, lack of Early Child Care and Education (ECCE) facilities, migration, seasonal occupations are some of the factors, which stand in the way of the educational attainment of these children. Illiteracy of the parents, early marriage, community loyalties, lack of awareness, and social stigma are some of the problems which hampers the educational development of the DNT children. Poor educational attainment of DNTs is associated with combined factors, like lack of access to schools, teacher absenteeism, poor quality teaching and unserviceable curriculum, unsuitable working hours in schools, and so forth. Lack of effective coordination, delays in supplies of textbooks, uniforms and other school incentives, weak monitoring and evaluation, lack of enrolment campaigns, lack of community control, lack of incentives for better performance of schools are some of the administrative factors affecting

the communities. Thus the current educational scenario of DNTs can be explained under the following areas—administrative structure, accessibility, quality, participation, economic condition, educational system, peoples' attitudes, level of awareness, aspirations of the teachers and administration, innovative approaches, policies and so on.<sup>2</sup>

### **Denotified Tribes and Social Context of Education**

Using the example of the DNTs of Andhra Pradesh, the present study throws light on the socio-economic conditions of DNTs in the country, particularly to education. There is a serious problem of inclusive education that fails to meet the educational demands of these tribes, further subjecting them to vulnerability. In this backdrop, an attempt is being made here to examine the factors of educational deprivation. While education may be accessed with greater sedentarisation (implicit in the development strategies employed by the states) DNTs have a self-perception and way of life which makes them less inclined to low wage employment—often the consequence of sedentarisation for the majority of the DNTs. Here a few questions arise: firstly what is the present educational status of the Denotified Tribes? What kind of education should one envision for

the children of the DNTs? Perhaps one that recognises them and includes them, one that is not entirely detached from their means of livelihood, etc. Importantly, how should education be imparted to children of DNTs? Should one improve through more regular teacher-student interactions, or coupling it with innovations in ICTs, radio, TV, etc. or laying greater stress on orality and experiential knowledge as witnessed in alternative education experiments? The Government should think of an educational programme that bridges the gap between knowledge and livelihood, and a comprehensive educational support system that has the potential of maximising their livelihoods; because most often it is difficult for the DNTs children to attend regular schools on account of their engagement in parents' occupation, characterised by nomadic activities. These nomadic tribes move from village to village in search of employment, or they move seasonally to urban areas in search of jobs. In this view, special mobile schools, Ashram schools, residential schools need to be opened for the children of these communities. The DNT children must have easy access to educational facilities provided by the administration. They need to be given an easy access and equal opportunity to education. At the same time, recruitment of teachers

to the schools may be done by adhering to the national standard of excellence on par with other schools, coupled with adequate infrastructural facilities. The DNT children should be provided access to the general schools, so that they too can have social co-education. To encourage primary education among them, more residential hostel facilities should be provided.<sup>3</sup>

### **State Provisions for the Education of DNT Children**

The State commitment to the education of denotified, nomadic and semi-nomadic communities' children is contained in Article 15(4), 45 and 46 of the Indian Constitution. Article 45 declares State's endeavour to provide free and compulsory education for all children until they complete the age of 14 years. In effect, both central and state governments took up the responsibility of implementing these special educational provisions. Along the same lines, the Backward Classes Enquiry Committee (1955), under Kaka Kalelkar, had recommended certain measures for the upliftment of the DNTs through education. However, no serious attempts have been made by the State or Central governments to implement these measures. Excepting a few, most of the people from DNT community still remain socially backward. The educational

standards amongst the DNTs are much lower than those of the rest of the tribes/communities. The reasons are: many of the parents of the children belonging to DNTs, who are charged with criminal cases, find it difficult to admit their children in normal schools as the other communities find some pretext or the other to keep them out. As a consequence, most of the students particularly girls belonging to DNTs are unable to even pursue primary education. It was felt that the scheme of education should be such that their children should make use of their innate abilities. Therefore, in the first two Five Year Plans the focus was on basic education, residential schools, the basic facility of schools especially in remote and tribal areas and also providing scholarships and books. The scope of enabling interventions expanded considerably after the fourth Five Year Plan. During the first Five Year Plan to fourth Five Year Plan, efforts were made to set up schools, educational centres, Samskar Kendras, Balwadis and Ashram schools. Scholarships were disbursed to school going students. However, from the fifth Five Year Plan onwards no specific education scheme, including vocational training programmes, has been initiated for their development.<sup>4</sup>

### **School Participation among DNTs Children**

Studies carried out so far, including reports of the various Commissions and Committees of SC/STs, do not show any significant educational progress of the DNTs children. The progress is rather slow and uneven. There is paucity of reliable information and the only sources of data that are available are the old census reports viz. 1901, 1911, 1931, 1941, 1961 and a few reports of the Commissioner and Commission for SC/STs. Very low literacy is also accorded to the DNTs, particularly in Andhra and Telangana. Worse, there is 0% literacy among the DNTs girl children. Though the state and central governments have undertaken some measures for the education of DNTs, there is still a long way to go so far as the educational progress of the DNTs is concerned. The field study also reveals a very poor attendance and enrolment rate in DNTs settlement schools among the age group of 5-14 years. The Government schemes and programmes do not have any positive impact in the DNTs schools. There is high dropout rate among the DNTs children at the primary stage. The impact of poor attendance and high dropout rates of DNTs children is visible in low completion rates of their enrolment and retention at the elementary school level.



Besides, educational disparities are visible within each category of the DNTs. The enrolment ratios in the settlement schools are very poor. The school attendance rates of the DNTs children are very dismal. Therefore, a proper census data of the school participation of DNTs children in different states needs to be urgently carried out for determining the accurate literacy rate, educational progress, attainment and challenges, educational problems, school attendance of children in the age group of 5-14 years, the dropout rates, percentage of enrolment etc. These issues need to be brought to light to understand the stark reality of their education. Since they are often subjected to both physical and social exclusion the DNTs have recorded lower enrolment and achievement rates and higher dropout rates than the general population, Scheduled Castes and Scheduled Tribes. A study, that was conducted by the Regional Institute of Education, Mysore under the sponsorship of Educational Research Innovative Committee (ERIC, NCERT) in 2005 in five selected DNTs schools in four districts of Andhra Pradesh, reveals high rate of absenteeism among the enrolled DNTs children. Absenteeism is higher in grades 1 to 5. Very young children and those old enough to help with household work are less likely to attend school regularly. Seasonal migration in

search of job, non-residential teachers, sibling care, illiteracy of parents, labour work, contract work, child labour, psychological barriers, seasonal occupation are some of the specific problems of the tribal children in the DNTs settlements. Extreme poverty has adversely affected the education outcome of the DNTs community for generations.<sup>5</sup>

### **Educational Inequality among the DNTs**

It is recognised that nomadic, semi-nomadic and DNTs in India are at the bottom of the educational and developmental pyramid. Their suffering is accentuated by the growing struggle for resources under the forces of globalisation and the many false promises of national and regional development made by government, and in the process they are sidelined and neglected. There is consensus among people that their situation is aggravated by the fact that governments do not try to understand their needs in education, infrastructure and political representation. They are far from receiving the benefits of development and social justice. Most of the DNTs work as labourers. They go to different places in search of jobs. Child labour practices are more common in these communities. So they continue to remain out of school. However, today, there is a growing demand and aspiration for

education among the DNTs tribes. The situation regarding school attendance, school completion and drop out rates in primary and middle school levels is unsatisfactory. There is also unevenness in educational participation levels due to the reason that many of the DNTs are not included in the list of Scheduled Tribes (Woddera, Dommara, Relli, Pamula, Boya and so on).<sup>6</sup>

### **Constraints to Educational Opportunities**

Children of the DNTs differ in certain qualities from the students from urban areas. The special qualities of these children are: (i) s/he enjoys complete freedom/does not like restrictions, (ii) he does not take the opportunity himself but takes if provided, (iii)s/he is not a leader but a follower, (iv) s/he is a slow learner because of lack of opportunities, (v) s/he can also learn like others, (vi) s/he is disadvantaged because of lack of opportunities, (vii) s/he possess inferiority complex, (viii) s/he is not speaker of words but a doer of deeds; (ix) s/he heads only those which are useful to him/her, (x) independent but not under others' direction, (xi) very disciplined, (xii) more self-respecting, (xiii) very simple and comes to do anything if convinced, (xiv) opportunities are not given to them due to vested interests, (xv) education must be

need based, (xvi) education through productive activities, (xvii) needs vocation based education, (xviii) requires activities to draw out innate potentialities, (xix) lacks distributive justice, (xx) not lower IQs than others, (xxi) participates in physical activities, (xxii) likes to learn through imitation rather than instruction and (xxiii) very bold. The DNTs children are very clean, articulate, honest, united and good sportspersons. However, there is a psychological impact on the children's minds when parents are taken by the police and kept in remand or jails. There is also a psychological impact on these children, when the general public and school teachers abuse them (sometimes), as they come from the DNTs families/settlements. Often the DNTs children face a number of problems in their settlements such as frequent quarrels, abuse, and harassment both from the police and the public in general. The parents also use children for the preparation of illicit liquor. The children often accompany the parents to distant places for their nefarious activities. They are well versed in code language used by their parents. Generally children are involved in petty trade and poultry work.<sup>7</sup>

### **Schools**

Each DNTs settlement has a school but no hostel. The DNTs schools are

not residential schools. Some of the DNTs schools are managed by the missionaries, for example Stuartpuram settlement is managed by the Salvation Army. This is meant to serve as an alternative to otherwise inferior mobile schools. However, the general feeling among the DNTs is that residential schools and hostels would imply isolation from their tradition, society and knowledge, because the DNTs children take up the profession of their parents from the age of 8-10 years, which ultimately leads to child labour. The hostels and the schools isolate the children from the other children in the schools and succeed in bringing the divide between DNTs children and other children from their society. Thus, the hostels and residential schools though viewed as a good thing by many, will result in a three-step alienation of these children. They will be distanced from the native children as well as their own kin groups and way of life. Parents hesitate to send their children, particularly girls, to these schools and hostels which further deprive them of the right to education. In the DNTs settlements, there are hardly any educated women. Most of the children in the settlements lack proper motivation to study. The current scenario is that the DNTs parents put their sons in hostels, and they prefer that they find secure government jobs. The girl children

are married off at an early age and drop out of schools. This is the situation prevailing in the DNTs villages.<sup>8</sup>

As far as school infrastructure is concerned, there are no proper school buildings in DNTs occupied areas. The existing schools are located in old buildings which have been constructed during the British period. Therefore, these schools do not attract the parents enough to send their wards to these schools. The condition is such that in one room, multiple classes are being held therefore, a few of them prefer to send children to neighbouring places/villages. Some of the DNTs schools operate with a single teacher, and teacher absenteeism in schools is rampant. The schools lack basic infrastructural facilities—no safe drinking water, no toilets, no electricity and no kitchen is available. Moreover, in some situations, teachers are transferred frequently. These schools do not have proper equipment such as furniture, blackboards and other teaching modules, learning kit/materials, etc. In addition, the teachers are not well-qualified and so teaching is also very poor. No proper housing facilities are provided to teachers who stay in the DNTs colonies. As a result of all these problems, non-tribal teachers do develop a negative notion of DNT children. Thus one may sum up that on account of the

frequent mobility of the family, anywhere for six months or a year, DNTs children rarely get an opportunity to attend formal education. There are virtually no educational institutions that have developed a system to cater to the educational needs of children on the move.<sup>9</sup>

### **School Quality**

Provision of schools within easy access has been relatively poor for the DNTs children when compared to the general population. The settlement schools are located in remote and thickly forested areas. Due to the geographical distance, the children are unable to attend the schools. The denotified tribal families usually live in segregated habitations. Their residential patterns have an impact on the physical and social access to schools. Only elementary/primary schools are available in DNTs settlements. Taking this into account, there is a need to upgrade the schools up to secondary and higher secondary levels. The DNTs have to send their children more than 20 kms or in some cases they go to other village schools to pursue secondary and collegiate education. The schools located in the DNTs settlements in Andhra Pradesh rank at the bottom, in terms of quality, infrastructural facilities and human resources. The level of education among the DNTs

communities is dismally low. According to some of the DNTs communities, only 10 to 20 percent of their community members are only educated. Their dropout rate is very high due to the nature of occupation that is nomadic. Poor education is a big hurdle in exploiting new economic opportunities.<sup>10</sup>

### **Teachers**

Keeping the DNTs children systematically out of schools through harassment means that there will not be any competition from the next generations of these communities for government jobs. The children of the DNTs are not welcome at the municipal schools of their 'settlement' areas. The DNTs children are harassed by children belonging to higher castes in public schools. At the same time, teachers also harass and abuse the DNTs children and do not care to address the problem, rather DNTs children are further victimised through harsh treatment from their teachers. It is also learnt that they are made to sit separately in the classrooms by the teachers, as a result of which a general consensus is drawn among the parents that it is better and safer to keep the children out of schools and train them in traditional skills to fend for themselves in future. Therefore, the children living in the 'settlement' areas are encouraged to engage in traditional occupations

with their parents, in an attempt to protect their children from such harassment at schools, which also means involving them in greater risk of vulnerability and social exclusion. Teachers, who are called to strike a balance between controlling the pupils and monitoring them to learn, here are perpetuating the process of exclusion by encouraging segregation among the students based on caste. It is also observed that teachers discourage DNTs children from mingling with children belonging to other communities. Furthermore, teachers demotivate and demoralise the DNTs children by dubbing them as slow learners, instead of attending to their educational needs.<sup>11</sup>

### **Educational Schemes and Incentives**

In the DNTs schools, scholarships and stipends are provided by the State government to support and encourage the children to continue and complete their education. The incentives earmarked for the DNTs schools are not properly distributed in the schools. The students do not receive their scholarships, uniforms, textbooks, notebooks, school grant, mid-day meals and other incentives in time. Even if the schools receive the incentives, the DNTs children are not able to get them from the school authorities. There is a great delay in dispatching scholarships. Sometimes, the government

scholarships never reach the DNTs children studying in remote areas.<sup>12</sup>

### **Language**

It has been recognised that education is more effective when imparted in mother tongue at the primary level, by the community members or bilingual teachers. While this has been integrated in educational structure of the DNTs communities the quality of education and teacher motivation is so poor that most of the children do not even qualify for admission or are not encouraged to speak their home language at primary or secondary schools. Though the Government of Andhra Pradesh has prepared bilingual textbooks, posters, dictionaries, glossaries, kits, materials and bridge inventories in tribal languages they are hardly of any use for the teachers working in the schools in tribal settlements. There is an urgent need for the training of teachers who are working in the DNTs schools to encourage the children to speak their mother tongue. Also, teachers should learn children's language for effective communication in the classroom. The Constitutional provision of Article 350A also recognises the importance of the minority languages. Children must be educated in their home language (mother tongue) at least at the primary level. Loss of a language means the loss of a certain way of

knowing the world. Experiences of schooling of the DNTs children in Andhra Pradesh have revealed the displacement of Yerukulas, Yanadis, Sugalis, Boyas, Waddars, Dasaris and other DNTs tribes. Therefore, the government should take effective measures to introduce the mother tongue (Banjara, Yerukula, Yanadi, Boya, etc) in primary education in DNTs settlement (village) schools under Sarva Shiksha Abhiyan (SSA) under Article 29(1) and 350A of the Constitution of India and inclusion of Yerukula and Banjara tribal languages in the 8<sup>th</sup> Schedule of the Constitution. Similarly, other DNTs languages also need to be considered.<sup>13</sup>

### **Curriculum**

DNTs children are imaginative participants in the process of defining their space, having the capacity to inhabit their own conceptual world whilst mediating and participating in that of adults. Which areas of the landscape/knowledge do the DNTs and their children attach meaning to, and how does their knowledge/skills relate to their own search for relaxation, play and excitement? Indeed the DNTs have rich folklore and art in their society. They take the central position in performing in their villages regularly. Storytelling, dances, puppetry, folk songs, music, community gathering—all these activities in

their society seem to contribute a lot to their children's fertile imagination and effective learning. After taking into consideration their culture specific curriculum this study hopes to ascertain the impact that restricted movements of many of the DNT communities could have a positive impact on their children's education, their physical and cultural well-being and natural aesthetics. This can certainly have a positive impact on their culture, creativity and transmission. This suggests a particular way of learning that is sensitive to the life conditions and situations in their colonies or villages. Integration of games, sports, music, cultural activities should be introduced in schools and in the school curriculum of DNT children. Virtually no value is attached to the sophisticated skills, knowledge systems and complex institutional structures of the DNTs which should be at the centre of every analysis of the continuous failure of education for DNTs. There is a virtual absence of focus in research on the nature of association between formal education and their traditional knowledge.<sup>14</sup>

The depth of knowledge the DNT people possess of their region, forest, flora and fauna and about their surrounding areas and thick forests is unmatched. The DNT communities have abundance of knowledge about the locally available resources,

herbs, medicinal plants, etc., however the local business communities extract medicinal herbs collected by these communities. Besides, children are talented and show acrobatic feats and exceptional skills in towns and markets, by performing their feats. Since they possess a variety of skills, the children derive their livelihood by organising cultural shows in public places. Many good sports persons, musicians, painters, dancers also can be found among the children of the DNT communities.<sup>15</sup>

### **Home, School and Community**

Harmonious relationship between school, home and community plays a very important role in improving the educational levels among DNT communities. Home atmosphere forms an important variable influencing the child's educational achievement. The child needs encouragement and assistance from family members for coping up with the demands of schooling. Community support, on the other hand, goes a long way in helping the teachers to perform their duties. Community involvement is essential for enrolling the children of the community and taking interest in the functioning of the school. With community involvement, the teachers will be more alert and focussed in performing their duties. Parents' associations and Village

Education Committees (VECs) are the bodies that are expected to bridge the gap between school, parents and the village communities. Effective functioning of these linkages or further activating these linkages is urgently required. This becomes crucial, considering the unique problems faced by the denotified communities.<sup>16</sup>

Among the denotified communities, family life is frequently interrupted because of the culture of crime. Though very few families indulge in criminal activities, the stigma attached to the community is still haunting the denotified communities. Due to perceived lack of opportunities, parents do not have enthusiasm in enrolling their children in schools. Generally, the educated adults from denotified communities are discriminated against in employment. Because of economic compulsions, parents regularly depend upon children to assist them, sometimes even in illegal activities. Poverty and the attraction of making quick money drive them to crime. Male members in some families are on the move, both for legitimate and criminal activities. Police harassment of parents, deeply affects the psyche of children and hence adversely affects their studies. Children coming from disturbed families lack interest in studies, therefore the best possible solution to this problem is to move

or shift them to residential institutions. Denotified communities face several problems on social and economic fronts. Wherever the members go their past haunts them. Efforts have been made by missionaries and social reformers to address the plight of the communities. Little success has been achieved so far because social reforms alone cannot solve the problem, without providing them a sustainable economic rehabilitation. The community is divided even among themselves on economic grounds; those who are well off strive for better education for their children in private schools, others remain indifferent. By and large, villagers hardly take interest in school affairs, which has a massive impact on the children's future prosperity.<sup>17</sup>

The word settlements is a misnomer and therefore, there is a need to change the nomenclature, that is, to use the names of modern villages rather than terms like settlements. Thirty years back the villagers of denotified communities wished to have protection from the police and public. They are often harassed, humiliated and beaten by the police. Today in the DNT colonies English medium schools are preferred. It proves the fact that there is an ocean of difference in their living conditions between thirty years back, when reform work started, and the present day. In the

primary schools of denotified tribal settlements in Andhra Pradesh the students face many discriminating and psychological problems. The children of denotified communities cannot be compared with general populace. DNT students still face different types of discrimination in all places, because of the stigma of criminality, even though the DNT settlements are made free colonies. Still the public use the word 'settlement' for these colonies. The Tribal Welfare Department should rename these colonies after some patriots.<sup>18</sup>

Pertaining to the language of the DNTs, the children are familiar with the home code language used by the parents. If the medium of instruction in school is the same as mother tongue, it will be more advantageous for the students to converse in the same language with the teachers. Teaching in mother tongue, in a way, will reduce the communication gap between teachers and students to some extent. Besides, there is a need for the village community to take interest in children's education. The parents and village elders should attend the village committee meetings regularly and contribute to the development of schools, not only by giving time but also in cash. The village elders should persuade the Mandal Revenue Officers (MROs) and other educational functionaries of that area to attend some of these



meetings. With their involvement, there is a scope of reducing school dropout rate in the village, by keeping a check on all factors affecting the problem. Most of all, villagers should be made aware of the importance of education, including girl child education. Sometimes the children go to the fields with their parents, protect the siblings, rear pigs, goats, sheep, and milk animals. The parents and children should realise the fact that education will pave the way for their future. The school authorities should take interest in promoting the DNTs' social and cultural activities and festivities. There is also gender discrimination in the family, favouring the male members and discriminating against female children. Among the Yerukula community marriageable age for a girl is 17 years. But today child marriages are taking place in these areas, adversely affecting the educational attainment of the girl child. If the village elders understand and solve the problem, then there is a scope for curbing these social evils.<sup>19</sup>

Another important factor is lack of attentive parent/s. Children have their demands, their own emotions. Unless they are satisfied they cannot be their normal self. In broken homes or when the father is absent, it is very difficult for children to adjust and go to school regularly. Father's absences, ill treatment by police, ill-treating the womenfolk when they

are in remands are factors which affect the mind of the child. The atmosphere prevailing in the school is quite different from that of the home. The influence of broken homes on children's academic achievement is inevitable. The state of education in all the settlements is almost the same. All the settlements should have a pre-primary school with training facilities so as to enable the children to join the State run schools. As members of the denotified tribes, they would like to have jobs which give them immediate remuneration and relief. Employment in labour intensive industrial establishments should be created for them so that they are absorbed in large numbers. This will give them immense satisfaction and confidence. This will make parents realise the importance of the education of their children. If the parents get financial benefit, then they will not force their children to go to labour contract work, child labour, rearing of domestic animals, etc. Also, if the teachers are able to educate the denotified groups, then automatically children will explain to them the importance of eradicating the practice of child marriage. The *panchayat* decides what type of punishment is given to those people. Such type of incidents leave a permanent stamp on the minds of the students. To improve the education of the children of the DNTs, the whole atmosphere should

be changed and restructured. For this betterment, the public, the community, the parents, the teachers and the government should all work like a team and improve their situation. There should be a committee at the state level to improve every aspect of their life in so called 'settlements'. Government officials, representatives of the DNT families, researchers, and social workers should form the committee. The psychological and sociological problems of the DNT communities should be understood by one and all. Electronic media should also help these villages in such a way so as to enable them to become free citizens and improve their living conditions; only then will the schools come up to the expectations. Otherwise, the development of these DNTs will remain as it is even after six decades of Independence.<sup>20</sup>

Even after 65 years of Independence, the rural masses in India particularly the DNT communities (to some extent in major towns and cities also) remain poor with regard to primary and secondary education. These communities are caught in the cobweb of development and transformation. Their villages are transformed into slums, and they continue to remain under privileged.<sup>21</sup> The quality of education in their schools and colleges is substandard. The educational

facilities provided to them are very poor. Their children are living in the midst of dirt, sickness and unemployment.<sup>22</sup> "We have heard that education brings development, but our children do not learn anything in the schools. We are living in poverty. We cannot afford to buy books and pay fees. Education has no benefit for our children. Education given in the schools has no connection with our day to day life. What kind of education our children are provided in the schools we do not know. Education does not bring development in our life", said some the inmates of the ex-settlements in Andhra Pradesh.<sup>23</sup>

The government of India appointed several committees and commissions to suggest measures for the development of DNTs, since 1950s. (Dr.K.B.Antrolikar, Kaka Kalelkar, Ananthasayanam Ayyangar, Mandal Commission etc). These committees recommended special educational facilities for the education of these sections of people. The facilities extended to the children of SCs/STs and OBCs should be extended to them also. But the implementation of the various committees' and commissions' recommendations was very little. DNTs children remained under privileged. The recommendations of these committees and commissions were totally ignored by successive

governments. Therefore, at least the current government should implement the recommendations suggested by various commissions' reports to improve education in all the areas wherever the DNT communities are inhabited.<sup>24</sup> It should be seen that within the next ten years, the educational standards of the DNT children should be brought on par with others by implementing the measures recommended by the various committees and commissions. Primary schools, secondary schools,

*ashram* residential schools should be provided in their localities including vocational training centres and more scholarship facilities. The directive principles of state policy enshrined in our constitution, with in a period of ten years with free and compulsory education for the children of DNTs should be the priority of the new government. The Right to Education of the DNT children should not remain a dream for these children.<sup>25</sup>

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# The Disadvantaged Child's Negotiation of the Dimensions of Time, Space and Relationality in an Elite Private School

DEEPTI SRIVASTAVA\*

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## Abstract

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*This article explores the narrative experiences of a disadvantaged child in an elite private school. It problematises the 'deep structure' of the school and explains how the child negotiates them in order to learn. Looked at from the dimensions of time, space and relationality, as proposed by Reay, it draws attention to the need to acknowledge the identity of the child to make teaching-learning more sensitive, responsive and meaningful.*

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## Background

Access to full time formal education is mandated by the RTE Act (2009) but there is considerable resistance by the elite private schools that refuse to admit these children by terming them as 'culturally different'. This 'cultural difference' is premised on the middle-class values of cleanliness, regularity, punctuality, deference to adult authority and a 'refined' language. Resistance to admitting disadvantaged children is so rigid that the elite private schools opposed the state mandate of

admitting 25% children of the marginalised groups Economically Weaker Sections (ESW) legally and by involving the authoritarian middle class parents (Apple, 1982). They highlighted the difficulties that these children would face by sitting on the same benches as the elite class and it also presented a sense of loss of standard as a result of this integration. Their arguments were that the poor "children who lack academic support from their families are likely to remain low performing, and may suffer by comparison." Two,

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that, “they would be faced with difficulties that stem from the contrast in social markers such as dress, possessions, parental profiles etc. All this could seriously affect the self-esteem of underprivileged students.” And three, that the government should improve its own schools rather than levying the burden on the well endowed private schools. It was even suggested that “instead of integrating them in elite schools, these private schools should establish separate schools for poor children” (The Hindu, 5 May, 2012).

On the face of it, the first argument seems to empathise with the poor child. Looking deeper, it acknowledges that the social relations, organisation of time, space and resources are favourable to the affluent individuals. This shows how schools perpetuate social order and are resistant to change towards a diverse composition of students. The second argument lays bare the deep set values of possessive individualism preserved by the school. The third argument points to the stark ‘apartheid-like’ separatism practised by the schools. Apparently empathetic, all the arguments reflect the neo-conservative view (Apple, 1982) of individualism, competition and a clear divide between ‘us’ and ‘them’. Here, “they are sapping our way of life, most of our economic resources, and creating government control over our lives.” (Apple, 2000, p.29).

To add to this, the virtuous ‘we’ even want to open ‘separate’ schools for the disadvantaged.

Contesting these arguments, a non-government organisation made an accord (Apple) with one elite private school in Delhi to admit some of the children living within its Children’s Home called *sneh ghar* (translated as Home of Love). This study is conducted with children from one such Home attending an elite private school. The admission in the elite public school is due to an informal partnership forged between the director of the Home and the school. The school, which is a member of a philanthropic society, bears the cost for the children’s fees, books, uniforms, picnics and annual day expenses.

### **Elite Public School**

The enrolment of children in the elite private school is seen as a matter of pride by the Home staff as well as children, as it is considered to be better in term of ‘standards’. These perceived better standards that distinguish an elite private school from other schools are related to the imposing physical structure, social and cultural demands of regularity, punctuality, discipline and academic demands of individuality and competitiveness; all qualities expected of the metropolitan upper middle classes that are rich, competitive and individualist. Such

elite public schools cater to the social class that occupies a dominant position. These schools are characterised by the reproduction of culture by the elite groups and a degree of social closure to other groups of society.

### **Objective of the Study**

The children of the Home, enrolled in the elite private school, carry a strong conviction that this will provide them crucial opportunities for educational advantage generally not available to them or their parents. The Home gives them an identity apart from their identity as beggars, rag-pickers and street vendors. This awareness motivates them to negotiate the differences they encounter in school, as disadvantaged children from a hostel rather than as children of the street.

The negotiation of differences that emerge in the interaction between the children, school and the Home affect the schooling experience of all children. These negotiations also lead to resistance and/or adjustment to school processes and penetrate many areas of later life. It is critical to understand these, as schooling contributes to individual adjustment in an ongoing social, economic and political order (Apple, 1982). For doing so, the present paper uses instances of negotiations of difference of one girl,

Simmi, out of the four girls from the hostel, enrolled in class V in this school.

### **The Child**

Simmi was rendered homeless when the state government demolished her slum in 2008, for beautification of the city for the Commonwealth Games. Her shanty was demolished two days after the notice for doing so was put up (Source: <http://www.countercurrents.org/hrln.pdf>). She has a mother, a brother and a sister. Her father is dead. Her father passed away due to a fatal insect bite when she was very young. Her sister Saira lives with her in the Home. Prior to coming here, she worked as a rag picker with her mother. Now her mother is a street vendor in the Jama Masjid area. Simmi too was engaged in street vending when she was contacted by the fieldworker from the Home. Her initial expectations from the institution were to address her health and educational needs. She consented to stay in residential care for protection, education and personality development (as mentioned in the form filled out by the fieldworker). She wishes to be a teacher.

The reason for choosing Simmi was to focus on elementary school children who constitute a pre-adolescent group, and at this age actively begin to explore ways in



which they can fit into society. At one level they think of who they are, and at the other, how people think of them in a societal frame of reference. They are not closely monitored by their parents or guardians (Weigert, Teitge and Teitge, 1986). The choice of her class (Class 5) was made because teachers were using continuous and comprehensive evaluation methods to assess their learning. As a part of this process children had more scope to work collaboratively and individually than when they are assessed using written examinations only.

### **Understanding Negotiation and Difference**

Narratives were considered central to understanding the negotiation of difference in the classroom context. This included conversations with children, observing their actions within the classroom to guide formulation of questions regarding their negotiations. It also consisted of unstructured interviews with the teachers, members from the hostel, and observations in the English, Math, Art, Games and EVS classes. Observations in the school and classroom were focussed on issues surrounding children's negotiation of difference. Adopting the concept of the 'minority child', as proposed by James and Prout (1997) it considers children's actions as

constrained within the structural dimension of the school where children are a segregated and regulated group. It also looks from the vantage point of their socio-cultural grouping and their individual agency to act, resist and reformulate the structural and ideological constraints imposed on them by the adults in school.

These structures at the institutional level are the school culture, the 'deep structure' (Apple, 2004) of the school that includes the underlying meanings that are negotiated and transmitted in school behind the transaction of the actual formal curriculum. These are seen in the everyday course of interaction between the teachers and children by interrogating the teacher's use of the categories of normality and deviance. In case of the children of the Home, this could be seen in the way the children were introduced to the class, the seating arrangement, the group activities, their identification as learners during the course of teaching-learning and so on. This was helpful in understanding the classroom interactions and children's own negotiations to uncover the boundaries "between different groups, the self and the others" which, as per Giroux, is important to "create a politics of trust and solidarity that supports a common life based on democratic principles that create the ideological

and institutional preconditions for both diversity and the public good (Giroux, 2005, p.28).

It is widely recognised that elite schools play a role in sustaining hierarchies of class and class segments through propagating and practising the culture of the dominant class. Here, 'culture' has a dual form. "One is culture as lived and another is culture as commodified in the form of 'cultural capital' which is the key to the differential access to school success by different socio-economic groups" (Apple, 1982, p.19). Culture as lived refers to the children's different socio-cultural identities where identity is a process as well as a hierarchical "multi-dimensional classification or mapping of the human world and our places in it, as individuals and as members of the collectivities" (Jenkins, 2008, p. 5).

### **Negotiating Differences**

Looking at the classroom context, how children interact with each other, engage with the texts and make sense of the teaching-learning process, depends on who they are. For instance, while reading a text a child understands it from where s/he is located in terms of gender, religion, region, language and so on. This way, s/he understands and even interacts with others, depending on what s/he thinks s/he is, what s/he thinks the others are and what

s/he thinks the others think about her/him (Jenkins, 2008). The way s/he enacts or performs identities in the classroom context depends on her/his experiences in her/his family, institutions as well as the larger social and political frameworks (McCarthy and Moje, 2002). Conversely, schools as institutions too, shape the formation of socio-cultural identity, and as such, become arenas in which social and cultural tensions and conflicts take place. These tensions are a result of the culture of schooling shaped and controlled by the dominant class, which poses cultural demands of regularity, punctuality, hard work, individuality, competitiveness and so on (Apple, 1982). These cultural values are 'natural' for some groups as the "kinds of knowledges, classroom language, teaching styles and assessment strategies which are given priority, reflect values, assumptions and practices which operate in the interests of students from one type of background or another" (Treuba, 1988, p 6). Termed 'cultural capital', (Bourdieu, 1997) these demands are negotiated differentially by different socio-cultural groups. Here, negotiation means enacting agency from the vantage point of one's socio-cultural identity to perform, compete, collaborate, co-operate or withdraw from cultural demands that are experienced by an individual or a

group. In other words, individuals and groups negotiate contradictory relations between the Home and school. This negotiation includes not only acting within the external structural and ideological constraints, but also enacting the subjective dimension to resist and reformulate these constraints.

By a careful study of the field, including the sites of the school and the Home, using narrative inquiry methods and reading the way children from disadvantaged backgrounds negotiate differences, I realised they do so across temporal, spatial and relational dimensions of 'culture as lived' and 'culture as commodified' (Reay, 2010). To these we now turn.

### **Of Temporality**

While sitting in a group with six other children from her class, Simmi struggles to think what to draw as her family tree. She looks at me as if seeking help. I ask her to draw the family tree of her Home and she does so. She hasn't revealed her family identity to her classmates. Her friend knows her as a poor girl, staying in a hostel away from her mother, in order to study. Her past as a street vendor becomes real when she goes home, during vacations or when her mother comes to the Home to attend parent-teacher meetings. But her family identity she keeps as a part of her past, as she negotiates in time

to project her present institutional identity (of the Home). In the Home, she stays in a room with eight other girls who attend the same school. All of them sit at night and do their homework. Sometimes when there is a shortage of staff, she and her room mates do not get time to do the homework. This is because those days they have to cook, clean and take care of the younger ones at the Home. Yet she somehow manages to negotiate time to complete her homework at school, in between classes, when one teacher goes out and the other comes in, or in the recess. This brings to attention the serious question of lack of 'personal time' that children from the Home face, as they have to attend to several tasks cooperatively and collectively, as against children from middle class families who get individual attention and support from their parents (mostly mothers) or through tuition classes (Vincent and Menon, 2011). Aware of this fact, Simmi sits in silent and rapt attention in every class, so she can listen to the teacher to understand the text even in a language (English) she normally finds difficult to negotiate. When the teacher alludes to other resources such as novels, the internet and newspapers to use for her homework, Simmi knows she does not have access to this 'cultural capital' (Bourdieu, 1997). All she has is contained in her bag that she carries

to school every day, instead of selectively following the time-table to bring only those required, as she is afraid her books might be misplaced at the Home and she doesn't want to risk being called 'careless' by the teacher. While at school, the teaching-learning is organised such that the students work at individual skill levels, on pre-specified individual tasks or worksheets and the "pedagogic activity is designed in such a way that the students only interact with the teacher on a one-to-one level, not with each other (except during the breaks)" (Apple, 1982, p. 32). As a result, Simmi does not get to interact and share with her classmates and thus does not have friends apart from the girls who belong to the Home. Time, here, does not permit forging friendships.

Here we have seen how Simmi negotiates the dimension of time which constitutes the continuity of her past identity in the present. She spends time for co-operative work in the Home and accomplishes her unfinished tasks in the time in-between classes at school. Further, her school day is structured into a time-table which constrains her from forging friendships.

### **Of Spatiality**

Children of the Home remain spatially distant from the other children. They are comfortable with

their own group, as they share similar cultural values which are different from the values practised in school. In a study done to understand adjustment of children from the economically weaker section in a private school, it was reported that "each of them commented on the fact that the children from the privileged backgrounds ... disrespect teachers" whereas teachers thought that these children are "unable to meet the so called 'standards' of the privileged children which is why they prefer to stay alone" (Mathur, 2008, p.62). These differences in perspectives arise due to the position that one is located in. Given space to work together in groups can help in reworking these perspectives. In a similar attempt, to let children work in a mixed group, the environmental science teacher told them to make their usual house-wise groups and prepare for the next day's group work. She appointed Simmi the leader of the group.

Simmi, reluctant to work in the group, said she would not be coming to school the next day. So, while the children have formed house-based groups to do experiments, which would be marked for formative assessment, Simmi sits on the fourth bench with her hands folded. The children (around 10 of them) have crowded the first three benches. She is sitting alone. Now she gets up

to find space on the first three benches where children are huddled and discussing. She doesn't find a place, mutters something and comes back to stand next to the fourth bench. She comes back to the third bench and peeps into the circle of heads discussing so she may be a part of it. She negotiates the space of the group to be in it but is not noticed and goes back. Later, she shares with me her feeling of being repeatedly rejected by her group mates, who do not include her and had refused her a part in the play once before, on the pretext of having no place for her.

Another time, she and her friends from the Home, are denied the opportunity to perform in any school function by the teachers. This was a 'penalty' to the entire group from the Home because one of them did not turn up for her dance on the day of the last year's annual function. When called up from school, she had not answered the phone. The school co-ordinator was angry as the school bears all their expenses. "They attend all picnics but they do not come for the annual function," she said. Then she had chastised the entire group by barring them from taking part in any function of the school. So the entire group is essentialised as one kind, not considering the fact that most of them did not absent themselves and wanted to take part. When asked if

they talked to the co-ordinator regarding this, so they could take part in the Independence Day parade where all children were participating, Simmi said, "*Par yahan ka function 14/8 ko hai aur Home mein bhi. To yahan part lein ya wahan humarey liye to dono acchey hain*" (But we have a function here on 14<sup>th</sup> August and even at the Home. So we can either participate here or there; both are equally good.) She negotiates the rejection in school space by acceptance in the space of the Home. When asked why she did not talk to the co-ordinator regarding this penalty for the entire group instead of talking to the girl concerned, she says, "*unsey dar lagta hai*" (I am scared of her.). This is in stark contrast to the situation at the Home where their 'papa' (father to all the girls and the director of the Home) listens to their problems and complaints. The children learn to negotiate the impervious power structure within the school by keeping silent, whereas at the Home, they can share their problems.

On another occasion, (Teacher's Day) the school allowed them to take part in the selection process, thus providing them access to compete. The selection criteria were decided by the children who were organising the Teacher's Day. They qualified the selection by confidently performing a dance on stage. Some of these girls have also qualified for participating

in the competition for karate and will be representing their school in the zonal competition. The involvement of these children in various co-curricular activities at Home, such as programme, dance, karate, singing and theatre with volunteers, in their holidays and vacations, gives them the 'cultural capital' to negotiate this space in school. This way the Home is acting like a middle-class home where parents "provide the sort of cultural experiences, ranging from shared reading activities to music tuitions and involvement in clubs and other activities outside the home which have significant benefits in terms of success in schools" (Hatcher, 2006, p. 212).

Here, Simmi negotiated the restriction and denial of use of space by projecting her knowledge which was valued by the school. While she is denied the use of space in school, she owns the space at the Home where her opinions are valued.

### **Of Relationality**

The relational aspect of education reveals the power differential among socio-cultural groups, which leads to what is often uncritically seen as the naturalness, ease, confidence and effort of one group as compared to that of the other in negotiating school expectations. It is seen that the children who are more in consonance with the school culture

belong to the middle-class. This class is more likely to equip the children with cultural experiences like reading activities, music, dance, tuitions, to involvement in various kinds of workshops outside the home, to gain advantage over the others in terms of success in schools. Middle-class parents are more likely to possess instrumental knowledge about how to aid their children's success in the education system by choosing a 'good' school, negotiating with the teachers, in order to secure a place for the child in a higher set and effectively supporting the child's homework or assessed coursework. In short, these parents possess the knowledge, communication skills and confidence to maximise their positional advantage in school (Hatcher, 2006). Expecting the residential home to provide the same level of engagement with the children, disregarding the backgrounds they belong to, makes the school coordinator say, "*Inka itna paisa maafhota hai to inko iska fayeda uthana chahiye. Par inki taraf sey koi effort nahin hai.*" (They should make use of the fact that they are not charged a penny. But there is no effort from their side.). She believes that the children are privileged to study in an elite public school and they should utilise this opportunity to the best of their ability. Rather, she believes that neither the children nor the Home

is making any effort, thus placing on them the onus of non-negotiability of the cultural demands posed by the school. As regards the teachers who are aware of the background of the children, they sympathise with them and, more damagingly, do not have expectations from them, misguidedly asserting that, “*Yeh padhna nahin chahtey*” (They do not want to study.).

Similar beliefs of teachers are seen to influence the performance and participation of disadvantaged children in different school cultures (Ahuja, 2012), as was also documented in an urban slum where, aware of the problems faced by the slum children, teachers still asserted that “these children are not intelligent enough to learn and it is useless to spend time educating them” (Jha and Jhingran, 2002, p. 211). The reasons attributed to this insensitivity are teachers’ demand for the norms of discipline, punctuality, cleanliness, regularity in attendance and homework and discrimination due to the ‘structural divide’ that governs the school culture as well as the relationships among and between teachers, children and, in this case, the Home.

While the class teacher is worried about their attendance, as these children often absent themselves, she never tries to find the reasons for that. Rather their absenteeism has given them the label of

‘unmotivated’, ‘unambitious’ and ‘underachieving’ children. Previously, the teacher who taught them was concerned about their work. She used to intervene when they did not perform well on tasks. As Simmi recalls, “...*jab kabhi humara kaam kharaab honey lagtaa thaa vo humsey khoob batein karti thi. Jaise Sabroon aur main kuchh din kahin aur rehney chaley gaye they (summer mein) Sabroon ka kaam kharaab ho gayaa thaa to unhoney bulaakar roz samjhaaya aur kaam vapis acchaa ho gayaa. Vo kaam bhi kum deti thi ki bacchey khel sakein. Nani ke ghar jaa sakein.*” (She used to talk to us when we did not do well at school. For instance, Sabroon and I went for longer (to our home in summers), Sabroon’s work deteriorated so she called her and counselled her and she improved her work. She gave lesser work so the children could play. So they could go to their maternal grandma’s house.). Here she also reveals the fact that children are loaded with homework during the vacations in order to structure their vacation time. So even when they are away from school, they are constrained by it.

Their absence, silence and aloofness from the children from the more advantaged backgrounds makes teachers and other students think of them as ‘lesser able’. As a result, Simmi gets rejected by her group when they have to perform a

play. She says, "*Pehley merey group waaley mujhey nahin le rahey they. Bol rahey they ab bacchey poorey ho gaye. To mainey ma'am se poochhaa. Unhoney bolaa doosra group join kar lo. Uskey baad unkey group mein bacchey kum pad gaye. To unhoney ma'am se bola ki maine doosra group join kar liyaa hai. Phir mainey unke group mein bhi bola.*" (Earlier my group mates were not including me. They said they had enough participants. Then I asked ma'am. She suggested I join another group. Later they were short of children in their group. Then they told ma'am that I had joined another group. Then I spoke in their group too.) This incident reveals the double-bind that she has to negotiate. In the first place, the children refuse her entry in the group and suggest she becomes a part of another group. When she joins the other, she is blamed for crossing over to another group. She negotiates this double bind by becoming a part of both groups.

At the same time, when children see that she has valued cultural knowledge, they appreciate her. This came to the fore when, during a formative assessment project, all children had to make rope baskets. The children appreciated her basket and commented that hers was the best. However, when she went to show it to the teacher she mechanically asked, 'Now what will

you put in this?', and then returned it to her without even an encouraging glance.

Simmi's classmate and friend Saiba, who is not from the residential home, is appreciative of her: "*Kuchh cheezein ye humse zyadaa accha kartey hain...jaise, yeh humse zyada accha dance kartey hain.*" (They do some things better than us...like they dance better than us.).

Simmi and all girls from the Home are supported by volunteers, who teach them dance, karate, art and theatre. As a result, they develop the cultural resources that position them better, to strategise being valued in school. For instance, Simmi is artistic and creative and she uses this knowledge to do well in projects and other practical work in the school. The math teacher says,

*"They are good at math. In fact last year they had to make a project and their project was better than the others. It was on area of the leaf."*

The relational dimension shows how children from the Home negotiate differences in relation to the privileged class, how school expects the Home to serve as a middle-class family, how school children are appreciative of the children from the Home due to their possession of culturally valued knowledge, despite their marginalised position in the social order. This shows that while they



struggle to learn the language, styles and academic demands posed by the dominant school culture, they also have valued knowledge in certain domains which the other children want to learn.

### **Conclusion**

We began the paper by showing how creatively Simmi reacts, to the rejection by a group of children in school, by pretending to participate in an activity organised by the Home where she feels more accepted and valued, as compared to that in school. Tracing her negotiations over time, space and relational dimensions reveals the struggle she and children like her have to undergo, due to their marginalised social grouping, in an elite public school.

The dimension of time in relation to the educational process shows how the marginalised children's past and present socio-cultural grouping restricts entry and access to opportunities that are available at school. There is a lack of understanding by the school that children like her, have a relatively low level of access to material, cultural and psychological resources that aid educational success which results in considering these children

as inferior. These further lead to the issues of othering that feed into and are fed by socio-cultural inequalities.

The dimension of space shows the relationship of the homeless street child to the Home and the school space. At school, these socio-cultural differences as lived and commodified in the form of 'cultural capital', are negotiated with the help of the Home providing opportunities to learn cultural activities valued at school.

The relational dimension reveals the crucial role of power within the institutions where all children become responsible for their success and failures, regardless of their socio-cultural identities. For those who have the resources to afford private tuitions, the degree of confidence and the power to negotiate with the school culture, lends pervasive mentality of intellectual superiority over the children belonging to the marginalised backgrounds. These dimensions are crucial to uncover the role education plays in augmenting these inequalities and to understand the manifestation and construction of difference within school so these can be addressed through a more responsive education.

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# Traditional Knowledge Systems in India and their Relevance

RAVI P. BHATIA\*

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## Abstract

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*Among the great civilisations of the world – the Greek, Roman, Mesopotamian, Mayan, Chinese, Egyptian civilisations that date back to about 8000 years ago, the Indus Valley Civilisation or as it is popularly called, the Indian civilisation is one of the richest and most ancient ones. Whereas several of these ancient civilisations have died or become enfeebled like the Egyptian and Roman civilisations, the Indian civilisation and culture along with the Chinese one, has remained alive and vibrant till date. There have been periods when our culture and civilisation have been overshadowed by foreign invasions especially during the British period when a concerted effort had been made to subdue, sideline and supplant Indian culture, politics, knowledge systems and our polity and economy.*

*The Indus Valley Civilisation is at least as old as 3,300 BC covered an area of more than one million square km that spread from present-day Afghanistan, Baluchistan, Pakistan and North West India to the upper reaches of the Ganges-Yamuna Rivers. Archaeological and textual records have been discovered with written records available from the Vedic period when the Vedic texts were composed in India in Sanskrit from about 1,500 BC.*

*Our culture and indigenous knowledge systems include education (at school and higher levels), agriculture, astronomy, architecture, Ayurveda, linguistics, philosophy etc. to name some principal areas of human activity and endeavour. Questions of healthy food and water management were also important. In this article I wish to talk about some aspects of our old heritage of learning and scholarship*

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*and discuss how some of the areas that were sidelined and began to languish as a result of British policies and beliefs are again beginning to show some revival. A concerted effort is being made to encourage and support the efforts of restoring and revitalising those areas that faced difficult and stormy conditions during the British period. Some aspects of our ancient culture like music and dance are of course not only surviving but also thriving.*

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**Let us focus on the following areas:**

- education system
- astronomy
- ayurveda and surgery
- indigenous architecture
- polluted Food
- water management

**Education System**

India had a rich and widespread system of education in ancient times. It might be called *religious* education (in modern terminology). Several well known books on the subject are available. Of these the books by A S Altekar (1944), R K Mookerjee (1951) and Dharampal (1983) are well known. The first two authors provide detailed knowledge about the type of education available in ancient India, the contents of this education, the nature of teachers and pupils and how this education system was conducted. Much of this information is available in Sanskrit language, although now some books have been translated into English and other languages. Mookerjee writes that in the ancient tradition, “the total configuration of ideals, practices and

conduct is called *Dharma* (religion, virtue or duty) and that it is religion that gave its laws to social life and organisation of ancient Hindus”. He adds “Nowhere is this distinctive tendency of Hindu thought more manifest than in the sphere of learning and education... Learning was prized and pursued not for its own sake, but for the sake of and part of religion.”

It is for this reason that the study of the Vedas was of prime importance. There were several scholars who expounded on the philosophies contained in the *Vedas*, the *Puranas* and other epics. Mookerjee refers to Panini the world’s first linguist and grammarian and his followers Patanjali and Katyayama who also expounded on the *Vedas*.

Another well-known commentator Manu writes that education was for all although Brahmin pupils were preferred. Some women also received education. There were women *rishis* called *Brahma-Vadinis* who were eligible for Vedic study and *upayana* (Vedic initiation for girls). Apart from the majority of Brahmin teachers, there were some non-Brahmin

teachers also when their need arose. Teachers were mainly of two categories – *Acharya* and *Upadhyaya*. Pupils would live and study in the house of an *Acharya* without payment of fees, but under the *Upadhyaya* system, pupils had to pay some fees. It is also to be mentioned that teaching was mainly done orally. Even when a written alphabet was developed in the Vedic period, the oral method was preferred.

In his well-known book *Education in Ancient India* AS Altekar writes that girls' education was quite common in the Vedic age. Women were allowed to study Vedic literature and perform various sacrifices up to about 200 BC. He writes that some of the compositions of *Rigveda* were made by women poets. A Vedic initiation for girls termed as *upanayana* was also common. This practice came to an end at the beginning of the Christian era. According to Altekar Buddhism also helped in spreading education among women of Buddhist families.

Dharampal's book *The Beautiful Tree* (1983) has provided several reports of the system of education prevailing in Madras Presidency, Bengal, Bihar and Punjab during different periods from the late 17<sup>th</sup> century to the middle of the 19<sup>th</sup> century. He gives information about the number of schools, the number of students (both boys and girls), and the years of schooling etc. and

contrasts these numbers with what was prevailing in England during the corresponding periods. In many cases the contrast is favourable to India. He also gives brief information about the education at college level. He finds that generally higher education was the domain of Brahmin boys who after some years of study at the elementary level went to *Vedums* and *Sastrums*; the former term implied the study of the *Vedas* the mother of all sciences. The latter term included study of all sciences – astronomy, law, theology in Sanskrit language. The teachers were mostly Brahmins. Both the teachers and the poor boys were supported by some kind of endowments or charity from zamindars or rich people of the community.

An M.Phil. dissertation by Akha Kaihirii Mao (2009) studies the traditional education system of the Nagas in Manipur in NE India where the *Mao* sub-tribe is the dominant group. The young scholar who himself belongs to the *Mao* community describes that this traditional education was imparted to both boys and girls who lived in separate dormitories (*Krochi* for male and *Elochii* for female in their language). The study attempts to explain how despite the fact that there was no formal written language among the Maos, this traditional *Morung* system was able to provide

a basic holistic education orally. Many skills and cultural values (folk tales and traditions) were also taught to these young students. Their religious faith that largely comprised worship of nature was also transmitted through this dormitory system.

Akha informs that this system was largely in vogue even as late as 1960 in some parts of Manipur. It was prevalent before and after the arrival of the British. Gradually, like all traditional systems of education, this system was discouraged as being primitive and non-scientific that needed to be changed to the modern western system of education.

Any system of education has the following components: the content, the organisation and the delivery system. While Dharampal's book gives information about the organisation and delivery systems of elementary and higher education in parts of India, it is almost silent on the contents of the system especially at the higher level. This is not surprising because the reports on which the book is based are silent about the content. The officers would not be competent to write about this feature in their reports both because of the ignorance of the Sanskrit language as well as the subject areas that were being taught at these institutions.

The aspect that I wish to stress is that while some parts of India may have been better in terms of numbers

in comparison to what prevailed in England, our content was not suitable in the areas of science and technology. Restricting ourselves to only science and mathematics, while the content followed in England and Europe led to tremendous advances in these fields, our system did not produce any scholarship of significance in these areas.

Names like Galileo, Copernicus, Isaac Newton, Joseph Priestley (chemistry), Daniel Bernoulli (Swiss physicist and mathematician), Joseph Lagrange (French mathematician and physicist) James Watt (Scottish inventor), Charles Darwin and Humphrey Davy (safety lamp) and countless others have developed science and mathematics and produced inventions of various types that have led to advancement of mankind and technology. It is hard to find a comparable name from India during this period.

There were some scholars who were working in areas of *Ayurveda*, linguistics and astronomy but these names are few and their contribution to science in general is limited. In linguistics the names of Panini and Patanjali and the former's work *Asthadhyayi* dating to about the 5<sup>th</sup> century BC is well known.

### **Astronomy**

Astronomy was another area in which our ancient scholars were adept. A systematic account of

astronomy in India begins with the *Sidhhantas* – the *Paitamaha Siddhanta* and *Surya Siddhanta*. It is known through various texts such as Vedic texts, Jain literature and books of renowned mathematicians like *Aryabhata* (b.476 AD), *Brahmagupta* (b.598) and *Bhaskara* (b.629 AD) that India had a rich and vibrant heritage of studying astronomical events. These texts were based on the knowledge that it was the sun that was stationary with planets, including the earth revolving around it. This knowledge was available much before western scholars who believed till the time of Copernicus and Galileo that it was the earth that was stationary.

Dharampal in *Indian Science and Technology in the 18<sup>th</sup> Century* (2000) writes that a British officer Sir Robert Barker visited Benares in 1772 and saw that there was an astronomical observatory which was known as the *Man Mandir* near the *Dasasvamedha Ghat*. The observatory whose date is not fully known is the oldest one in India and one of the oldest in the world. Unfortunately it remains in a dilapidated condition today.

The study of astronomical events involved the motion of the planets and some well known stars and was used in predicting the occurrence of lunar and solar eclipses as well as explanation of the phases of the moon. Sawaai Jai Singh was

instrumental in building observatories like the *Jantar Mantar* in Delhi, Jaipur and Ujjain to understand astronomical events and to predict lunar and solar eclipses. This was based on detailed and painstaking observations of astronomical events spread over long durations of time and a sound knowledge of the structure of the planetary system around the Sun.

### **Ayurveda and Surgery**

*Ayurveda* literally means the science of life. It is believed that Indian scholars like Atreya and Agnivesa knew the basic principles of *Ayurveda* as early as about 800 BC. On the basis of this knowledge Charaka and Sushruta respectively compiled the books *Charaka-Samhita* and the *Sushruta-Samhita* which are among the oldest known treatises on *Ayurveda* – the former dealt mainly with physiology and medicine and the latter with surgical operations.

Sushruta who lived about 2600 years ago wrote a book called *Sushruta-Samhita* which describes more than 120 surgical instruments and 300 surgical procedures that demonstrate how surgery was practised at that time. Plastic surgery as it is called today, was also practised by Sushruta and continued to be in vogue even during Hyder Ali's times in the 1770s. Sushruta is often referred to as the



'Father of Surgery' for his immeasurable contributions. Surgical operations during Susruta's time were performed using opium, wine, Indian hemp and of course by tying up the patient. During the Muslim period alcohol was also used for this purpose.

Even as late as about a half century back, *Ayurveda* was looked down upon as being not 'scientific' and rigorous; it was thought to be based on only pragmatic experience that was beneficial only in certain uncomplicated cases of illness. It was considered a 'hit and miss' type of cure unlike the western allopathic system of medicine that was based on rigorous experimental trial based methodology. Today however this attitude has largely changed, and there is revival of *Ayurveda*. Its benefits are well recognised and there are medical institutes both at under- and post-graduate levels offering degrees in Ayurvedic medicine. Research is also going on in the properties of traditional plants and herbs.

*Ayurveda* treats the disease in a holistic manner and is dependent on knowledge of trees, herbs and plants which have medicinal values. A few books like *Useful Plants of India* published by CSIR, New Delhi in 1986 and a book edited by A K Kalla and P C Joshi (2004) have given very useful knowledge of the properties of these plants and herbs and how

they are being used for curing various diseases like diabetes etc. In the latter book (pp. 351-361) Dolly Murmu has written an article "Plant use among the tribals of Jharkhand" describing the many plants, trees and herbs that have medicinal and curative properties. She provides their local and botanical names and gives the methods of preparation of medicines from these plants. She however cautions that 'plant remedies are harmless provided they are selected carefully and taken under medical guidance'.

Efforts by the Yoga Guru Ramdev and his associate Balkishan are already on to study and classify various plants in northern parts of India for prevention of diseases and their cures. They have written an interesting book *Ayurveda-jadi booti rahasya* (in Hindi) which was published by *Divya Prakashan*, Hardwar in 2008. The book is profusely illustrated and gives the properties of several herbs and plants along with their local and botanical names. Beneficial properties of some of the common trees like *neem* (margosa) and plants like *tulsi* (basil) and *haldi* (turmeric) are well known. Efforts at patenting some of the extracts from these plants were rejected in western countries as it was successfully proved by Indian experts that these plants were age-old and their properties were also well known and documented in

various places in India since times immemorial. Other plants like 'gilohe' (*tinospore species*) have properties of curing diseases like diabetes etc.

It is interesting to refer to the well known Kerala Ayurvedic physician Itty Achudan Vaidyam who lived in the Malabar area in the second half of the 17<sup>th</sup> century. Based on Itty's knowledge of traditional forms of Ayurvedic curing and the several palm leaf manuscripts that he had written, the Dutch governor of the region *Hendrik van Rheedee* compiled a book called *Hortus Malabaricus* in Latin. This compilation which comprises 12 volumes with sketches and copper plate engravings took a long time – about thirty years and was published from Amsterdam between 1678 to 1693. It has been subsequently translated into English and Malayalam languages by Dr KS Manilal.

### **Indigenous architecture**

We are confronted with huge monoliths of buildings – all steel and glass that shine invitingly on a clear day. This is the sign of urbanisation. The more the urbanisation, the taller and grander are these buildings. But what happens when you step inside? These buildings will consume megawatts of electricity whether in summer or winter and are difficult to maintain. Contrast this with the style of buildings whether individual

homes or palaces or temples etc. Earlier these buildings in India used natural sources of light and sunshine for cooling in summer as well as for heating in winter. In northern India both summers and winters are harsh as a result of which it was imperative to make buildings that could bear the brunt of the weather. This was done by what Vinod Gupta in 'Indigenous Architecture and Natural Cooling' (private communication) calls natural cooling which required shading of building surfaces from sunlight, selective ventilation etc. and 'space use'. The latter term required users to 'organise daily activities in space and time so that not all spaces had to be maintained at equal levels of comfort...'

These techniques are well known even today but architects trained in western concepts of building huge structures of cement and steel are not keen to make use of these. Of course there are constraints – shortage of land in urban areas as a result of which one has to construct multistoried structures. But even here indigenous methods of allowing light and sunshine or preventing of sunshine in hot months could be utilised by suitable modification.

Another related feature of Indian architecture is *Vaastu Shastra* which basically is a traditional form of designing buildings that takes into account the surroundings, geographical locations and similar

features. It is also related to certain superstitions which dictate the design as well as the methods and timings of starting the building work.

The type of houses or buildings is also naturally dictated by what materials are available locally and also whether it is located in a village or urban area. A *kachcha* building is made of materials like grass, mud, bamboo and rarely uses bricks or cement etc. These houses are easy to make and easy to move if required and are also economical.

Although these *kachcha* houses are easy to build they require certain skills and techniques that are part of our heritage. India is well known for continuity in indigenous craft design and passing on of skills from generation to generation. But this does not mean that there is no change or that these skills are static; these traditions and skills keep on evolving depending on local culture, needs and the environment and result from a healthy dynamism found in the artisans. Some of the homes or dwellings especially made by certain tribals like the Gonds are not only comfortable to live in but are also beautiful and artistic. Efforts must be made to keep these traditions and skills alive.

### **Polluted Food**

Both water and food that we consume are quite often polluted. While the reasons for water pollution are

generally seepage of harmful chemicals from factories and throwing of garbage and sewage in rivers and lakes, food has become unsafe because of pesticides and chemical fertilisers that are increasingly being used in agriculture. Earlier, farming was generally organic in nature that made use of natural fertilisers like cow dung and bio-degradable materials; today the emphasis is on chemical fertilisers and pesticides for prevention of crop disease. This use is increasing from day to day and pesticide residues make food unsafe for humans and cattle and also result in frequent crop failures. We do not wish to detail here the problems arising out of chemical based agriculture but a large number of farmers' suicides are a tragic reminder of how things have gone wrong and what needs to be done to alleviate this problem.

In a recent TV show, anchored by the well known Hindi film actor Amir Khan (24 June, 2012) and his article in *The Hindu* newspaper (25 June, 2012) the focus was on pesticides which were introduced to increase crop yields especially after the Green Revolution in the 1960s. However, these made the food that we ate poisonous and unsafe. Spraying pesticides also exposes the farmers to their harmful effects because of their proximity and contact. *The Hindu* article also talked about the benefits of organic farming especially

in the state of Andhra Pradesh and how this was helping the farmers economically as well as in producing pesticide-free food. The Chief Minister of Sikkim also said on the show that his state has gone fully organic in agriculture by avoiding use of pesticides or chemical fertilisers.

The trick is to understand and apply traditional methods of farming including growing not just one crop like wheat or rice but growing a cocktail of crops in close proximity. The latter practice allows natural pest resistant and nitrogen fixation techniques that avoid the use of chemical fertilisers and pesticides that are both expensive and harmful.

### **Water Management**

Dwindling sources of water for human and animal consumption as well as for agriculture has become a major concern all over the country. States like Rajasthan and Gujarat in Western India are particularly prone to this problem. The problem is becoming serious and may lead to a catastrophic situation if remedial measures are not taken. It is easy to ascribe the scarcity to increase in population, climatic changes and resultant irregularity of rains. Although, some irregular patterns of rainfall have been observed lately, the major factor cannot be ascribed to this phenomenon alone.

Traditional methods of water conservation (*harvesting* is a modern

term) were sufficient and flexible to meet unusual conditions of drought. They were followed by all. People were aware of the constraints in the availability of water both for domestic use and for agriculture and faithfully remained confined within these constraints. Proof of these practices can be seen easily and have also been well documented by several authors. They are recommending the adoption of these practices to face the contemporary situation that has arisen in the development paradigms being followed and the insensitivity of modern man to this issue.

Fortunately, some enlightened NGOs and concerned citizens have woken up to this challenge and have been able to not only highlight the impending catastrophe of water shortage, but have taken some positive steps to avert this. The efforts of Rajendra Singh and his organisation *Tarun Bharat Sangh* to revive the sub-soil water in some parts of Rajasthan like Alwar are well known. He has succeeded by studying the traditional indigenous methods of water conservation and replenishment of water bodies like wells, *baolis*, lakes etc. Through this study and by adapting appropriate procedures, the organisation has largely succeeded in the objective of reviving agriculture and animal husbandry which has helped people who were forced to migrate, to return to their villages since water was

available again for their daily needs.

Another study of the arid and semi-arid regions of Rajasthan has been made by Mayank Kumar (2009) in his paper on “Flexibility and adaptability... of water management”. He has highlighted the different methods of water harvesting that were earlier being practised in these regions which were subject to erratic and insufficient rainfall. He has examined the traditional agricultural practices being followed in these regions in the pre-colonial times. His paper also considers the interface between community and the state for suitable methods of water management. He also suggests some insights relevant for contemporary situations.

Anupam Mishra of Gandhi Peace Foundation, Delhi, who has devoted the last few decades to the problems of scarcity and harvesting of water, has also referred (private communication) to traditional methods of conserving and replenishing water bodies and has strongly recommended certain measures to address the problems of water scarcity that is affecting human, animal, plant lives and agriculture.

Mishra has eloquently talked on several occasions in the media and through his well known book *Taalaab* (in Hindi) about the disappearance of water bodies like lakes, *baolis*, wells etc. in many parts of the country including Delhi. He has also

talked about the *Thar* area in Rajasthan which is almost a desert with very scanty rainfall – only about 16 cm in a year. Although this region is undeveloped in terms of infrastructure, it has been able to provide safe drinking water to almost all villages in this region. How? By community efforts and by conserving each drop of water; by not allowing bottling plants like Coke or Pepsi to divert water from the local villages.

Thus we notice that our own indigenous knowledge systems of water management are not only relevant, but also essential to alleviate the problem which could otherwise grow in unmanageable proportions and have serious implications for life.

## **Conclusion**

The foregoing sections highlight the highest standards our civilisation achieved in various fields. But after so many centuries of this intellectual and material development and evolution, we reached a plateau and then began to decay and decline in many of these areas. It is easy to explain that this was due to European, especially British imperialism. The latter resulted in not only the British becoming our masters politically, but also adversely affected our thinking, psychology and existence and approach to life and inevitably led to a decline in our attainments in diverse areas of

learning and scholarship. This would be an easy excuse for our withering away. However even if it is largely true that with the advent of British imperialism our civilisation took a downward turn, we have to rebuild and reboot ourselves and try to acquire the strength and self confidence to develop and reach the pinnacle that we had reached in earlier eras.

To decry colonialism for all our faults would not only be misleading, it would also hamper our efforts at restoration of our civilisation. We must analyse our principal shortcomings – why we stooped so low and why we allowed our knowledge and skills to wither away. We must also accept that the western education and imperialism despite all its drawbacks also had a positive side. It brought us several benefits like modern science and technology; it brought railways, telephones, electricity, post offices and countless other benefits and society received a welcome boost. The introduction of these elements brought the various parts and regions of our country closer; the Indian nation that we are today was brought about mainly by British colonialism. The various principalities and minor and major kingdoms that largely lived apart without much interaction have come together due to not only the British but also efforts of sagacious men like Mahatma Gandhi, Jawaharlal Nehru

and Sardar Patel. Earlier a person would not usually travel more than a hundred miles in any direction from where he lived. Except for *rishis* and *dharamacharyas* and some other holy men who travelled all over the country and reinforced the concept of Hindu religion, people hardly travelled beyond a limited distance. That explains why we had so many kingdoms and *rajahs* and *nawabs* and so many languages and customs. Religion has united large parts of the country although the rituals and deities differ even today.

We have today a united army, a robust bureaucracy, widespread infrastructure and link languages in the form of English and Hindi that have brought us together and given us the concept of nationhood and a country.

We cannot forget the period of subservience and overlordship under the British rule. We however, can pick up the best they provided us in terms of modern science and technology, extensive infrastructure and a spirit of nationhood. But we must go beyond these ‘gifts’ that they provided. We must identify our own special character or *swabhav* and build on it. There were many ills in our society that great men like Gandhi, Tilak, Tagore, Vivekananda, Ambedkar and Nehru among others pointed out – our caste system and social prejudices etc. and victimisation of the poor and the

marginalised. These faults or ills were pointed out by people who were educated in the modern sense either in England or through the western system of education. Thus the western education system had the ability to identify and comprehend the ills and faultlines in our social and economic systems. Now that these and other similar faultlines are known to us – discrimination, poverty, lack of basic necessities etc.

and now that ours is a mature democratic nation that believes in justice and rule of law, we must delve deep into our social ethos, liberal religious base and a deep rooted Indianness to find the solutions to our problems.

The study of our ancient indigenous knowledge systems can help and guide us in this lofty endeavour.

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# Effectiveness of Inquiry Training Model in Teaching Science at the Secondary School Level

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## Abstract

*This study attempts to investigate the effectiveness of Inquiry Training Model (ITM) in teaching Science at secondary school level. Four chapters of physics of class IX were taught to 50 students through ITM method and 50 students through conventional method. The two groups of students were equivalent in terms of age, sex and their previous knowledge of concepts taught (pre-test). Students were assessed using the same test after instruction (Post-test I) and retention of learned concepts was assessed after 15 days of instruction (Post-test II). Gain in achievement and retention of both the groups of students was compared using t-test and it was found that gain and retention of students receiving instruction through ITM method was more than that of the students receiving instruction through conventional method.*

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## Introduction

“Science is a great human enterprise, not only endless and faceless but also stable and fluid. It is a self-accumulation, self-growing, self-pervading, self-accelerating and self-correcting enterprise which originated in the collective curiosity of man since time immemorial.”

[Vaidya, 1997]. It has seen continuous advancement through researches leading to development of technology for greater application by the society, thus, becoming a priority field of education at all levels. It is a major subject area which equips the learner with the development of proper understanding of the subject matter and also helps in dealing with

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various phenomena around him in a more scientific way. The main aim of science education should, therefore, be development of abilities like questioning, inquiring, creativity etc. in the learners. These aims can never be achieved if science teaching is restricted only to the transmission of facts and concepts. Therefore, it is important that teaching of science should emphasise on the development of abilities and not only on the transfer of subject contents. In other words, we may say that science education should primarily be concerned with the education of mind rather than acquisition of knowledge.

The National Curriculum Framework (NCF 2005) also recommends that "curriculum should help learners to become constructor of knowledge" and emphasises "the active role of teachers in relation to the process of knowledge construction". However, the reality is not exactly so. The primary objective of science teaching has been transfer of subject matter. Science is a most challenging subject and it requires an inquiring mind on the part of the student but the teachers do not bother to accept their responsibility of inculcating such habits among students. This is evident from the low enrolment in higher science courses. This problem of low enrolment has bothered many researchers (Bridgham, 1973;

Dietrich, 1973) and they infer that teaching style could be related with low achievement and low enrolment. It was found in above studies that most of the teachers had direct mode of teaching. Though the place of teaching science is at the top of hierarchy of different subjects, the researches in this area have been relatively scanty. The teaching of science in schools generally conforms to the traditional methods and continues to be dominated by teacher by making it dull and uninspiring. An observation of a traditional classroom gives a general impression that the teacher is either lecturing or dictating notes. Apparently, there is no active participation of learners in the teaching-learning process. Instruction is not well-organised and much emphasis is laid on memorisation of facts and concepts.

In secondary schools, physical science is regarded as one requiring intellectual skills to collect and analyse data to solve problems. In fact, science process skills such as observing, classifying and collecting data act as prerequisites for integrated processes usually taught in secondary schools like hypothesising, controlling variables and defining operationally (Tobin and Capie, 1982). "Whether our focus is on classical education, the new math, or basics, the ultimate goal of education has been to teach children to think critically and

independently” (Sternberg and Baron, 1985). Various educationists and researchers have developed a number of models of teaching for various general/specific purposes. Joyce et. al. (1992) has suggested that the Inquiry Training Model is a prominent model for development of inquiring mind as well as for teaching of concepts in science at secondary school level.

Inquiry in teaching of science refers to the process of questioning, seeking knowledge, information or facts about phenomena. It involves investigation, searching, defining a problem, formulating hypothesis, gathering and interpreting data and arriving at a conclusion. Inquiry model was propounded by Suchman. The basic philosophies behind this model are—

1. Pupils inquire naturally when puzzled.
2. They can be conscious of and learn to analyse their thinking strategies.
3. New strategies can be taught directly.
4. “Co-operative inquiry helps pupils to learn about the tentative, emergent nature of knowledge and to appreciate alternative explanation”. (Joyce and Weil, 1992, pp.199-200).

Suchman provided a systematic structure within which the students are required to ask questions to understand the possible cause of

occurrence of the event in that way, to collect data and process it scientifically to develop a hypothesis capable of explaining the event. The inquiry training starts with presenting a discrepant event or a problem situation. The students are motivated to solve the puzzle by collection and verification of data through various experimentations.

Hofstein and Walberg (1995) suggested that inquiry-type laboratories are central to learning science since students are involved in the process of conceiving problems and scientific questions, formulating hypotheses, designing experiments, gathering and analysing data, and drawing conclusions about scientific problems or phenomena. Kuhn et al. (2000) argued that students who undergo inquiry process “come to understand that they are able to acquire knowledge they desire, in virtually any content domain, in ways that they can initiate, manage, and execute on their own, and that such knowledge is empowering” (p. 496). Malacinski (2003) worked on “student-oriented learning: an inquiry based developmental biology lecture course”. He concluded that the use of the Socratic Method increases as the course progresses and represents the most successful aspect of the course.

Seeing the importance of science at school level and suitability of

inquiry training model in the development of an inquiring mind among learners, an experimental study was undertaken to investigate the effectiveness of Inquiry Training Model in teaching Science (Physics) at secondary school level.

### Objectives

The main objectives of the study were as under–

1. To find out the effect of treatment on learning of students belonging to Inquiry Training Model, and Conventional Method groups.
2. To compare the mean learning scores of the students belonging to Inquiry Training Model and Conventional Method.
3. To find out the effect of treatment on retention of students belonging to Inquiry Training Model, and Conventional Method groups.
4. To compare the mean retention scores of the students belonging to Inquiry Training Model, and Conventional Method groups.

### Hypotheses

The following null hypotheses were formulated and tested during the study–

- H<sub>1</sub>: There is no significant effect of treatments on learning of students belonging to Inquiry Training Model, and Conventional Method.
- H<sub>2</sub>: There is no significant difference between the mean learning

scores of students taught through Inquiry Training Model when compared with Conventional Method.

- H<sub>3</sub>: There is no significant difference between the mean retention scores of students exposed to Inquiry Training Model when compared with the students exposed to Conventional Method.

### Population and Sample

The population for this study was a group of students of secondary schools and the sample consisted of two intact sections of class IX taken from an intermediate college of Varanasi district of Uttar Pradesh, India. These sections were highly comparable with respect to sex, age, intelligence and past achievement in science. The final sample consisted of 100 students having 50 students in each of the two groups who took part in the entire process of experimentation. The students who were absent during the process of teaching or testing were dropped from the final analysis.

### Tools

Two types of tools were used–

- Treatment Tools–The lesson plans based on Inquiry Training Model and Conventional Method on selected topics of physics developed by the researcher.

- Observation Tools –
    - a) Intelligence Test
    - b) Achievement Test on selected topics of physics prepared by the researchers.
- taught by the investigator himself. They were taught the same concepts of physics for same time duration. The detailed procedure of the experiment is given in Table 1.

Table 1

**The Schematic Presentation of the Experiment**

<i>S.No.</i>	<i>Phase</i>	<i>Activity</i>								
1.	Pre-Treatment	The following tests were administered to both the groups: <ul style="list-style-type: none"> <li>• Test of Intelligence</li> <li>• Pre-Test i.e. achievement test on the selected topics</li> </ul>								
2.	Treatment	The selected topics were taught to the groups as follows: <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; text-align: center;"><b>Experimental Group</b></td> <td style="width: 50%; text-align: center;"><b>Control Group</b></td> </tr> <tr> <td style="text-align: center;">Through Inquiry</td> <td style="text-align: center;">Through Conventional</td> </tr> <tr> <td style="text-align: center;">Training Model (ITM)</td> <td style="text-align: center;">Method (CM)</td> </tr> <tr> <td style="text-align: center;">N = 50</td> <td style="text-align: center;">N = 50</td> </tr> </table>	<b>Experimental Group</b>	<b>Control Group</b>	Through Inquiry	Through Conventional	Training Model (ITM)	Method (CM)	N = 50	N = 50
<b>Experimental Group</b>	<b>Control Group</b>									
Through Inquiry	Through Conventional									
Training Model (ITM)	Method (CM)									
N = 50	N = 50									
3.	Post-Treatment	Both the groups were administered the post test-I immediately after the treatment								
4.	Delayed Post-Treatment	Both groups were administered post test-II after a gap of 15 days from the treatment to measure retention.								

These tests were to measure pre-test as well as post-test I and II.

**Experimental Design**

The present study is an experimental study for which pretest-post test equivalent group design suggested by Best (1983) was adopted. The design consisted of one experimental group and one control group. The experimental group was taught through Inquiry Training Model and the control group was taught through Conventional Method. The experimental as well as control treatments were assigned randomly to the groups. Both the groups were

**Data Analysis**

The data collected was analysed using various statistical techniques. The nature of data was studied by computing mean, standard deviation, skewness, kurtosis etc. Data analysis was done by applying t-test. The significance of difference between teaching methods were found out by using t-test on mean learning and retention scores and the results were tested at 0.05 and .01 level of confidence.

**Results**

A summary of means and standard deviations of the scores obtained

from both the groups on different stages of experiment have been presented in Table 2.

On the basis of above results the first hypothesis of no difference between the experimental and

Table 2

**Means and Standard Deviations of both the Groups at Various Stages**

Stage	Experimental Group (N=50)		Control Group (N=50)	
	Mean	S.D.	Mean	S.D.
Pre-test	7.52	3.12	7.44	3.26
Post-test I	39.16	5.92	32.18	5.56
Post -test II	32.27	5.12	26.77	5.45
Gain (Post test I-Pre test)	31.64	5.01	24.74	5.17
Retention (Post test II- Pre test)	24.75	4.95	19.33	5.04

The achievement scores of both the groups have been compared to find the effectiveness of the treatments on the basis of t-score calculated for various groups of comparison at various stages. A summary of t-values of the groups at various stages of comparison have been presented in Table 3.

control group could not be rejected i.e. the groups were alike with respect to their achievement in science at pre-treatment stage. The t-value for all the other comparisons was sufficient enough to reject the null hypothesis of no difference between groups at 0.01 level of significance i.e. the treatment has a positive

Table 3

**Summary of t-values at Various Stages**

Comparison Groups	Stage	t-value	Significance
ITM-CM	Pre-test	0.125	NS
ITM-CM	Post-test I	6.077	0.01
ITM	Pre test _ Post test I	33.433	0.01
CM	Pre test _ Post test I	22.39	0.01
ITM-CM	Gain	4.277	0.01
ITM-CM	Retention	2.84	0.01

effect on the groups in terms of achievement in science. The gain and retention scores were also compared and it was observed that the gain and retention of students receiving treatment through ITM method was more than the gain and retention of students receiving treatment through Conventional Method.

### **Major Findings**

- Both the models were found effective in teaching of science at secondary school level when measured in terms of pupil learning immediately after the instruction.
- The Inquiry Training Model was found more effective than the Conventional Method in teaching of science at secondary school level when tested immediately after completion of the treatment.
- The Inquiry Training Model was found to be more effective than the Conventional Method in the measure of retention of the learned concepts.

The Inquiry Training Model has been found to be more effective than the Conventional Method in terms of pupil learning and retention. The results of the study are supported by other researchers (Adams, Bevevino & Dengel, 1999; Sungur, Tekkaya & Geban, 2001; Lord, 1999; Marek, Eubanks & Gallaher, 1990; Seyhan & Morgil, 2007; Anderson, 2002; Carak, Dikmenli and Saritas, 2008).

The possible cause for this effectiveness may be the use of method of questioning by the students in the Inquiry Training Model. They were actively involved in the learning process and have carefully observed the event in question and drawn inferences rather than memorising contents. All these steps together helped the student in better understanding of the subject leading to higher achievement and retention for the students of this group.

The results of this study have implications for the students, student teachers, teacher-educators and in-service education of teachers.

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# Teaching-Learning Mathematics in the Constructivist Classroom

## A Field Experience

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### Abstract

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*Teaching mathematics to those students who do not have a strong base in mathematics is challenging. Same is the case for learning mathematics as far as the students are concerned. The present paper explains probable reasons for this issue supported with empirical evidences which are collected through multitude of sources during a three-month field visit at Central School for Tibetans, Bylakkube, Karnataka. Past performance in mathematics of tenth standard students and the opinion of teacher concerned about student's performance in mathematics were taken as a background for undertaking a small action research. The study combined both quantitative and qualitative research techniques for collecting and interpreting data. Triangulation methodology was incorporated for drawing appropriate conclusions. Findings reveal that poor performance in maths can be explained by correlates like students' mathematical base, attitude towards mathematics, study habits and parental involvement.*

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### Introduction

Mathematics is generally considered one of the most important subjects at school level all over the world. All the major commissions and committee reports on education since Independence rightly

emphasised the importance of mathematical knowledge and its utilitarian values. In spite of all these reports and recommendations, many students struggle with mathematics and become disaffected as they constantly bump into obstacles to

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engagement. It is a fact that, amongst the subjects taught in schools, mathematics is considered one of the toughest subjects. But reason for this might be different in different situations. Many studies have been conducted in this area and researchers have come up with their recommendations as well. Still the problem of low performance in mathematics appears to plague all levels of school education. This of course is a serious issue to be tackled, possibly by teachers.

Recently the author had an experience of teaching in Central School for Tibetans (CST) Bylakuppe, Karnataka, for three months the subject of mathematics as a part of our field work. There the author got an opportunity to teach continuously two sections of tenth standard students. The very first experience the author received from the Principal and teacher concerned in Mathematics was quite challenging. They told the author that the performance of these students in mathematics was lower than their performance in other subjects but while comparing their mathematics performance with performance of students from other classes (VI, VII, VIII, and IX) they are far better. The interaction with the students during the first week of the field visit also gave the author a chance to verify those remarks made by the Principal and Mathematics teacher. Then the

author thought of finding out the various reasons for their low performance in mathematics and some strategies for improving their performance accordingly.

### **Research Questions**

Many studies and reports have come up with various reasons for low performance in mathematics. One of the important factors is teacher-related such as method of teaching, personality of teacher etc. As a classroom practitioner the author is very confident of using appropriate strategies of teaching in order to create interest among the students. Review of literature related to this problem highlights many student-related and other factors, which contribute to the academic achievement of students. From the discussion with principal, teachers and students and exposure gained through classroom observation during the first week helped the author to concentrate on some factors like attitude towards mathematics, basic knowledge in mathematics, study habits and parental involvement. But the author needed to know which factor among these significantly influences mathematics achievement. Accordingly the author decided to find answers to some of the questions like:

Which factor can best predict the mathematics achievement of these students?

What are their relative contributions for predicting mathematics achievement?

How can the author help these students to improve their mathematics achievement?

### **Review of the Literature**

Many researchers found that, the attitude of students towards study of mathematics had the highest correlation with mathematics achievement. The study conducted by Patel (1997), came up with the finding that study habits and academic achievement are positively correlated. This supports the findings of the study conducted by Panchalingappa (1993), Chauhan (2003) and Zadoo and Rana (2008). The influence of home support on Mathematics achievement was done by Pal and Nagarajan (1997) through their study on gender and mathematical mystique and found that home support along with teacher support and response to teaching influenced the perceptions and attitudes related to mathematics and all these factors interactively influenced the mathematics achievement for boys and girls. Casanova et al. (2005) concluded that variables of family environment (parental acceptance, control, involvement in ward's education and expectation of success) plays an important role in predicting academic

achievement. This supports the findings of the studies conducted by Hill & Craft (2003); Marcon (1999); Stevenson & Baker (1987).

Hadi and Al-Ommar (2009) while studying different factors contributing academic achievement, found that student level variables (prior achievement and self concept) were more important than school level factors (gender, number of students in school, and teachers' satisfaction).

In sum, research has shown that the factors like attitude towards mathematics, study habits, mathematical base and parental involvement all contribute positively to the academic achievement of students. Certain factors are more important than others in predicting academic achievement. This relative importance differs from one situation to another. How far these factors are responsible in the given context of Tibetan School with a majority of students from Tibetan refugees' families was a concern for me as a researcher and as a teacher. Hence a detailed study of their relative importance will help me to frame suitable strategies for teaching in order to help the students to improve their performance in mathematics.

### **Methodology**

Descriptive Survey Method was employed for the study.

### **Tools used**

The following tools were used for collecting relevant information.

**Study Habit Scale (SHS)**—It is a self-made tool which consists of 50 items in the form of a 5-point Likert scale. These 50 items were classified into seven components namely Concentration, Remembering, Organising time, Study technique, Taking notes, Examination, and Motivation.

**Parental Involvement Scale (PIS)**—This scale consists of 18 statements with three alternative responses namely ‘always’, ‘sometimes’ and ‘never’. This test contains items to be responded to by the students, about the assistance and support rendered by their parents for their study at home as well as school.

**Mathematics Base Test (MBT)**—This test was developed to assess the ability of students in basic mathematical ideas of number operations and number sense up to the sixth standard. This consists of 25 multiple choice items with a maximum time of 20 minutes.

**Scale of Attitude towards Mathematics (SAM)**—To assess the attitude of students towards Mathematics a scale developed by Santhamma Raju and Ancel Maria was used. It consists of 32 statements

related to mathematics with five alternative responses.

**Achievement in Mathematics**—In the present study it was considered on two different occasions. In the initial stage of the study academic achievement score was the marks scored by the students in the first formative test. The second time, the marks scored in the second Formative test were considered.

### **Site and Participants**

Central School for Tibetans (CST) Bylakuppe, Karnataka, is one of the main Senior Secondary Schools under Central Tibetan Schools Administration (CTSA), New Delhi, an autonomous organisation under the Ministry of Education, Government of India, with the primary objective of providing education to Tibetan children living in India. Like all schools in India they have a tri-lingual system of instruction—the local language, English and Hindi. Tibetan is the main language from the first Standard to fifth Standard with some English. From sixth Standard up, English is the language of instruction. Students continue to study Tibetan in secondary school and Hindi is added to their curriculum. The primary sections (Class I to V) are scattered at various areas of Bylakuppe and the main school consists of classes VI to XII.

The participants of this study were two sections of tenth Standard students with a total number of 40 students — 23 boys and 17 girls. Out of these 23 boys 3 were Indian and remaining Tibetan. All girl students were Tibetan.

### **The Plan of the Study**

The first three classes during the first week of the field visit were used for creating a rapport with the students through personal discussion and motivational talk. Their personal likes and dislikes were shared during these conversations. Attitude scale and Study Habit scale were administered subsequently. The Parental Involvement scale and Mathematics Base Test were administered at the end of the first week. The data collected through these tools was then analysed with the help of appropriate statistical techniques.

### **Statistical Techniques Used for Analysis**

The quantitative data was analysed through suitable statistical techniques, namely, Product Moment Correlation, Multiple Regression Analysis and t-test. Qualitative data was also used for cross-checking the information gathered through quantitative analysis with the help of triangulation methodology.

### **Analysis and Discussion**

To find out the influence of the selected factors on achievement in mathematics the correlation between these factors and academic achievement was calculated and is presented in Table 1.

From the above table it can be seen that all the selected variables are positively correlated with achievement in mathematics. Moreover the variables Attitude towards Mathematics and mathematics Base are statistically correlated with academic achievement at 0.01 level of significance. The correlation is statistically significant for Study Habits at 0.05 levels of significance. In the case of Parental Involvement even though the correlation is found to be positive it is not statistically significant. The above correlation matrix also shows that the relations between these predictor variables are also statistically significant except in the cases of correlation between Parental Involvement and Attitude towards Mathematics, and Parental Involvement and Mathematical Base. The positive correlation between all these variables is an indicative of the effect of all these factors on the achievement in mathematics.

Table 1  
**Correlations Matrix for 4 Predictor Variables and Achievement  
 in Mathematics**

Pearson Correlation		Achievement in Maths	Attitude toward Maths	Mathematics Base	Study Habits	Parental Involvement
	Achievement in Maths	1.000				
	Attitude toward Maths	0.543*	1.000			
	Mathematics Base	0.437*	0.414*	1.000		
	Study Habits	0.312**	0.378**	0.332**	1.000	
	Parental Involvement	0.227	0.190	0.069	0.462*	1.000

(\*) correlation is significant at the 0.01 level

(\*\*) correlation is significant at the 0.05 level

During the open discussion with students at the beginning of the field visit, they were asked how they felt about learning mathematics. Some of the opinions are hereunder:

"I am not able to understand all the formula And in class when ~~tell~~ I understand very well. But when I come home that time I ~~am~~ not able to understand where to start and I get confuse.

When we learn all the formula we face confuse of the formula. Does not want to by heart the theorem and example we face lot of confuse for doing different problems. Formula and identities is very difficult to by heart. When we learn more in maths the chapter I learn is not coming and also I am very to learn maths.

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Because maths is more confusing & we have to think a lot. While doing maths test, we of kind a feel like almost ~~questions are forgetting~~ all we had learnt. While doing maths, due to pressure we ~~are~~ are unable to use our thinking skill & what we had learnt. There should be ~~are~~ many formulae.

because can't think that much as it is so tough In class teaching time we understand and can write but in exam it is very tough & couldn't do it. That is the problem learn all formulae but don't know ~~how~~ when to use specially in trigonometry & quadratic polynomial.

In the class the teacher teach us and sometimes I understood but when I get home and try to do some problem the solution didn't come at all. ~~By time~~ The teacher teach very fast at last minute & I couldn't understand at all. Teaching us again & again, like if ~~I~~ I ~~get~~ understood & other students didn't & teacher teach us another method & it makes me all confuse & can't understand at all.

These remarks made by the students themselves shows how they approach mathematics. Almost 90% of the students opined in a similar fashion. This shows their attitude towards mathematics, their study habits and the problems they face due to lack of strong base in mathematics. This also supports the findings we just arrived at on the basis of the correlation analysis. The opinion of the Principal, Teachers and the marks obtained by the

students in the first formative test also supports this finding. Regarding the mathematics base, majority of students faced difficulty even in simple mathematical operations. A girl who was good in all subjects including mathematics has done a mathematical operation as part of a problem like the following —

$$113-64/113-49 = -64/-49 = 64/49$$
 (By cancelling 113 from numerator and denominator)

Another student when asked to measure the three internal angles of a triangle using protractor measured the angles like this:

$$\angle A = 68^\circ, \angle B = 139^\circ \text{ and} \\ \angle C = 111^\circ$$

Students were able to solve math problems using four fundamental operations but they took more time in completing the computation. Therefore, these incidences draw special significance of a strong mathematical base for developing and motivating students in enhancing their mathematical knowledge. The problem faced by these students in this area, as the author observed through classroom interaction, also supports the findings of the above quantitative analysis.

Furthermore, to find the answer to the second question, the author decided to analyse the quantitative data using multiple regression analysis. The details of the regression model and the summary of the regression analysis are given below.

Since there were four predictor variables and one dependent variable, the regression model can be explained as follows:

$$Y = f(X_1, X_2, X_3, X_4)$$

Where Y: Achievement in Mathematics

X1: Attitude towards Mathematics

X2: Mathematics Base

X3: Study Habits

X4: Parental Involvement

The summary of the full regression results are given in the Table 2.

Table 2  
**Summary of the Multiple Regression Analysis**

Predictor Variables	B value	Standard Error	t value
Constant	14.387	2.034	7.07*
Attitude towards Mathematics	3.923	1.021	3.842*
Mathematics Base	1.321	0.531	2.488**
Study Habits	0.236	0.126	1.873
Parental Involvement	0.027	0.078	0.346

(\*) significant at the 0.01 level

(\*\*) significant at the 0.05 level

Regression Equation is

$$Y = 14.387 + 3.923X_1 + 1.321X_2 + 0.236X_3 + 0.027X_4$$

Regression model obtained clearly indicates that all the predictor variables has positive influence on the dependent variable, i.e., achievement in mathematics. It gives the relative influence of the variables also. The greater B value (3.923) obtained for the variable Attitude Towards Mathematics shows that out of these four predictor variables, the contribution of Attitude Towards Mathematics is relatively more. In other words, positive attitude towards mathematics will influence achievement in mathematics. The corresponding t value of 3.842 is



statistically significant at 0.01 level of significance. Hence it can be concluded that attitude toward mathematics has a significantly higher influence on achievement in mathematics. The next higher B value is for Mathematics Base (1.321), which indicates that for this particular group of students the second most influential factor for achievement is Mathematics Base. The corresponding t-value is also statistically significant at 0.05 level of significance. The next influencing factor is Study Habit and the least influential is Parental Involvement.

### **Actions Taken**

From the correlation matrix given above in Table 1, we found that Attitude towards Mathematics is significantly correlated with Mathematical Base and Study Habits. This shows that their combined effect on Mathematics achievement will be very significant. This indicates that if the teacher can employ some strategies to improve their mathematical base for helping them to solve different problems confidently, then automatically their attitude towards mathematics also will change positively. Similarly a strategy for developing a positive attitude towards mathematics in turn will influence their study habits also.

Based on these observations the author decided to use different

strategies that could be helpful for developing positive attitude towards mathematics, improving their mathematical foundations and forming suitable study habits. Some of the activities the author incorporated during the three-month field visits are briefed below.

### **Shortcut methods in Mathematics**

A shortcut method of solving mathematical problems using Vedic mathematics was practised for one period every week. This activity not only helped them to improve their base in fundamental operations but also helped to develop a positive attitude towards mathematics.

### **Co-operative group work**

This was used invariably on many occasions during the classroom teaching process. This helped me to create interest among the students, which in turns helped to develop positive attitude as well as a good study habit. The following example illustrates how this strategy has been used in the classroom while teaching the concept *basic proportionality theorem*.

A brief introduction was given. Students were divided into four groups and one among each group was selected as leader. Each group was asked to cut different types of triangles from chart paper (at least five different types) and told them to

give names like ABC, PQR etc. They were asked to draw a line (with suitable name) parallel to any one side of the triangle by touching its other two sides.

In the next stage they were asked to measure the length of the intercept made by the line with the other two sides and they were asked to prepare a chart which is given below:

<i>Triangle</i>	<i>Length of Intercept made at 1st side</i>	<i>Length of Intercept made at 2nd side</i>	<i>Ratio of Intercept made at 1st side</i>	<i>Ratio of Intercept made at 2nd side</i>	<i>Relationship between the ratios</i>
$\Delta$ ABC					
$\Delta$ PQR					

In the next step all leaders were asked to sit together and discuss their findings. They were able to generalise the conclusion.

After this discussion they were again asked to sit in the original group and leaders were asked to convey the conclusion they derived to the other group members.

### **Involvement of Students in Assessment**

Peer Assessment and Self Assessment as a mechanism for improving learning has been used in the classroom. This strategy helped them to assess themselves as well as their peers. The continuous feedback

they received encouraged them to learn more.

In order to know how far the author was successful in his attempt to improve the performance of these students in mathematics, a comparative analysis was done by using the marks of second formative test, which was conducted in the second week of September with that

of first formative test. The detail of the analysis is given below:

Table 3  
**Mean, SD and t-value of Mathematics achievement score in FA1 and FA2**

<i>Test</i>	<i>Number</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>t-value</i>
FA 1	40	23.26	6.12	3.17*
FA 2	40	27.35	5.33	

\* Significant at 0.01 level

The above table shows the mean marks obtained in two tests namely FA 1 and FA 2. The mean difference of 4.09 is indicative of improvement in the performance in mathematics. The significant t-value also shows

that this difference in performance is statistically significant. But this result alone cannot be considered as a claim for the success of my strategies. The opinion the author received from the students about the classroom transaction and their attitudinal change towards mathematics also indicates that the strategies incorporated in the classroom were successful.

### **Conclusion**

The study attempted to find out some of the major predictor variables for achievement in mathematics for a sample which mainly consisted of Tibetan students. It is evident from the finding that the better the student's attitude towards Mathematics, greater is the Mathematics achievement score. Similarly higher level in mathematical base gives better result in

achievement. It was also found that attitude towards mathematics is positively and significantly correlated with mathematics base. Even though it is an action type research which comprises only 40 students of one school, the findings have wide implications. If the teacher can use an appropriate strategy to develop a positive attitude towards mathematics, students will automatically start studying maths. Another crucial dimension to be addressed is regarding the foundation in maths. If the teacher can help to develop this attitude from the primary classes onwards, this problem will never arise. Otherwise, the mathematics teacher should spend at least one class per week (or free time) for improving their basic mathematics skills using various shortcut methods as well as puzzles.

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# Visually Challenged Students' Proficiency in the Use of Abacus

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## Abstract

*Abacus is a device, useful for visually challenged students as it presents mathematical operations in tactile form. Training in the use of abacus is a must at elementary level. Proficiency in the use of abacus is essential to visually challenged students, not only for learning higher level mathematics but also for their independent living. This study has been carried out with an objective to study elementary level visually challenged students' proficiency in the use of abacus. Findings of the study show that their level of proficiency is very low. Although students in the given sample are little aware of the history of the abacus very few of them know about basic operations like addition and subtraction. They were totally unaware of the functions like multiplication, division, decimal and fraction. It also shows that learning to use an abacus is a big challenge for them.*

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## Introduction

The lack of ability to see imposes several difficulties in the learning process of visually challenged students. Visually impaired learners rely on sequential observations i.e. only part of an object can be seen or felt at a time. Presenting concepts in

concrete form is the best way to teach them. Mathematics has always been considered a tough subject due to its abstract, speculative, cumulative and reflective nature. It is a creative science with its own specific language capable of nurturing the imagination and reasoning ability

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of learners. The difficulty of learning mathematics is often mentioned by highlighting its nature. But Mathematics occupies a central place in the curriculum as it has strong roots in every discipline. Not only in science, but mathematics also plays a very significant role in subjects like geography, history etc. Thus, every discipline uses vivid branches of mathematics to make the learner understand their concepts easily. This problem solving tendency of Mathematics imparts the learners' psychological support and philosophical attitude.

Students with visual impairment require appropriate devices for learning mathematics in order to compensate their deficiency of vision. Abacus is an important device in teaching basic mathematical calculations to the visually challenged. It provides concrete mathematical experiences to visually challenged students. It is a tactile as well as faster mathematical calculating device. It is a simple device with a frame and a rod horizontally attached to the frame and beads placed on the parallel rods. The horizontal rod divides the frame into two parts. It assists through

performing calculations by sliding, representing various values, along a set of rods. Additionally, it plays an important role in solving the problem in a concrete manner. The standard abacus can be used to perform addition, subtraction, division and multiplication, decimal etc. One of the advantages of abacus is that learners can calculate simple mathematical problems rapidly and accurately. In addition, they acquire the ability to do mental calculations utilising the abacus image, which allows quick calculation without actually using the abacus. Abacus is a true assistant for an individual who wants to perform calculations quickly. It enhances understanding as well as mastery in certain mathematical concepts and enhances the effective learning of operations.

### **Need and Relevance of the Study**

Learning mathematics is as important for visually impaired children as it is for students who can see. As mentioned, abacus is a calculative device by which visually impaired a students can learn basic mathematical concepts while other students learn the same things using paper. Several researches have shown the importance of the abacus in teaching of mathematics. Pui Yee

(1982) found “Abacus students are found to be superior in the accuracy of their memory and the number of digits they are able to memorise when compared with non- abacus learners of the same age. According to Stigler, Chalip, and Miller, (1986) “skills and conceptual knowledge of the numeration system...this device is useful for improving calculation skills as well as abstract concepts. Abacus Learning will improve numerical memory, spatial arrangement and progress in solving general mathematical problems taught in elementary school. Training in abacus will be helpful for visually impaired children to do basics calculation and computation. Proficiency in abacus creates a solid background to learn mathematics at secondary and higher level. Abacus should be introduced as early as possible in schools.

After extensive and intensive review of related study on this topic, it is found that not even a single study has been conducted in the recent past in local context to study the competency of visually challenged students in the use of abacus at elementary level. Hence, the need and relevance of this study is justified.

### **Statement of Problem**

The problem of this study has been stated as, “Visually Challenged

Students’ (Elementary Level) Proficiency in the Use of Abacus.”

### **Operational Definitions of Terms Used**

**Proficiency in Use of Abacus:** It refers to knowledge of effective use of abacus in solving basic arithmetical problems using calculation and solving decimals and fractions.

**Visually Impaired Student:** It refers to both totally blind as well as low vision students.

**Elementary Level:** Those visually impaired students who are studying in classes 5 to 8.

**General Objective:** To study the competency level in the use of abacus among visually challenged students at Elementary Level.

### **Specific Objectives**

1. To study the visually challenged students’ general awareness about abacus.
2. To study proficiency in use of abacus to do fundamental arithmetic calculations i.e. addition, subtraction, multiplication and division.
3. To study proficiency in the use of abacus to solve decimals and fractions.
4. To study the challenges faced by visually challenged students in learning abacus.

## Methodology

The descriptive survey method was used in the present study to know the proficiency of students with visual impairment in use of abacus.

## Sample

The sample size of the present study was  $N = 36$ ; which were obtained from blind students of two different districts of Lucknow city in Uttar Pradesh. Random purposive sampling technique has been used.

S. No.	Name of the School/ Itinerant Camp	Locality	No. of Students
1	Rajkiya Sparsh Balak Inter College	Lucknow	10
2	Rajkiya Sparsh Balika Inter College	Lucknow	12
3	Nav Jyoti Blind School	Mohanlal Ganj	14

The concise idea of the selected sample is as follows –

## Tool Employed

A mixed type questionnaire was developed by the researchers to obtain complete information about awareness, proficiency and challenges encountered by students with visual impairment.

## Interpretation and Discussion of Result

### 1. The study of the visually challenged students' general awareness about abacus.

The first objective of this study was to study the visually challenged students' general awareness about abacus. The data obtained in this respect has been reported with frequency (F) and percentage (%). The related results based on them have been given below in Table 1.

Table 1

### Summary of item, frequency and percentage regarding visually challenged students' general awareness about abacus

S.No.	Item	Positive attempt	%	Negative attempt	%
1.	In which country was abacus used first?	10	28	26	72
2.	Who was the inventor of abacus?	00	0	36	100
3.	How many wires are there in abacus?	26	72	10	28
4.	How many beads are there on one wire in the lower half?	26	72	10	28
5.	What is the place value of one bead on a wire in the upper half?	10	28	26	72



### Interpretation and Discussion

Table No.1 reveals that a majority of the students are aware of the parts of abacus and their functions. Twenty-six (72 per cent) students were aware of the number of wires and number of beads in one wire in the lower half whereas 10 (28 per cent) were unaware. Only 10 (28 per cent) out of 36 responded positively regarding place value of one bead in an upper wire whereas 26 (72 per cent) responded negatively. None of the 36 students was aware of the inventor of abacus and only 10 students (28%) knew the name of the country in which abacus was first used. They exhibited a huge ignorance of the knowledge related to history of abacus, which is quite disappointing.

### 2. Proficiency in the use of abacus

The second objective of this study was, 'to study the proficiency in use of abacus to do fundamental

arithmetic calculation i.e. addition, subtraction, multiplication and division. The data obtained in this respect has been reported in Table 2.

### Interpretation and Discussion

The above table reveals the proficiency of visually challenged students in four basic mathematical operations – addition, subtraction, multiplication and division. Proficiency in the use of abacus for doing basic operations is essential as these four basic computational operations form the basis of higher level computation. The finding of the study shows that average score in addition and subtraction is only 2.11 and 1.8 respectively. None of the students were able to do multiplication and division with an abacus. Conclusively, the status of proficiency in use of abacus is very dismal and needs urgent initiatives to improve it. Findings of this study

Table 2.

#### Findings Related to the Proficiency of Students in Performing Basic Operations-Addition, Subtraction, Multiplication and Division on Abacus

S. No.	Operations	Total	Average Score
1.	Addition	10	2.11
2.	Subtraction	10	1.8
3.	Multiplication	10	00
4.	Division	10	00

are corroborated by the findings of Tripathi (2007) which reported that visually impaired students face problems in learning mathematics due to lack of pre-requisite skills of handling mathematics devices and non-availability of resource teacher.

### 3. Proficiency in use of abacus to solve decimals and fractions

The third objective of this study was to study proficiency in use of abacus to solve decimals and fractions. The data obtained in this respect has been given below in Table 3.

Table 3

#### Findings Related to the Proficiency of Students in Performing Decimal and Fraction on Abacus

S. No.	Operations	Total	Average Score
1.	Decimal	10	00
2.	Fraction	10	00

### Interpretation and Discussion

The above table reveals that none of the students was able to solve problems related to decimal and fraction with abacus.

### 4. Challenges faced by visually challenged students in learning to use an abacus

The last objective of this study was to study the challenges faced by visually challenged students in learning to use an abacus. The data obtained in this respect has been reported with frequency (F) and percentage (%). The related results based on them have been given below in Table 4.

### Interpretation and Discussion

The above table reveals the challenges faced by visually impaired students in learning to use an abacus. Out of 36 students, 28 (78 per cent) reported

Table 4

#### Summary of Item, Frequency and Percentage Regarding the challenges faced by students with Visual Impairment in Learning to use an abacus

S. No.	Items	Yes	%	No	%
1	Have interest in learning to use an abacus	28	78	08	22
2	Abacus is useful for you	30	83	06	17
3	Teacher's attitude positive toward abacus	24	67	12	33
4	Teacher motivates you to use an abacus	15	42	21	58
5	Teachers are trained in use of abacus	24	67	12	33
6	Teacher provides sufficient time in teaching abacus	06	17	30	83
7	Proper place of abacus in time-table	06	17	30	83
8	You feel difficulty in displacement of beads due to visual impairment	21	58	15	42

9	School provides abacus	6	17	30	83
10	Have own abacus	12	33	24	67
11	Find difficulty in learning abacus	12	33	24	67
12	Calculating with abacus is tedious	15	42	21	58

that they have interest in learning to use an abacus whereas 08 students (22 per cent) reported that they don't have any interest in learning abacus which itself is a big challenge. 30 out of 36 i.e. 83 per cent students consider that abacus is useful for them. Majority of students are aware that abacus is a useful device for computing. A total of 24 students i.e. 67 per cent of the students spoke in favour of the teachers' positive attitude towards use of abacus i.e. majority of the teachers are aware of the significance of abacus in teaching- learning process of mathematics to visually impaired children. Moreover, emphasising the use of abacus motivates the students to learn abacus but only 15 students, accounting for 42 per cent respondents, said that teachers motivate the students to learn abacus. 24 students responded that teachers are well trained in use of abacus whereas 12 students i.e. 33 per cent responded they were not. Satisfying responses obtained regarding the competency of teachers in use of computer. But only 6 out of 36 respondents i.e. 17 per cent reported that teachers did provide sufficient time in

teaching abacus and time table did not have proper time for abacus. In this regard, Sharma (2009), in his study, stated that 60 per cent of the teachers opined that there are some areas in the mathematics curriculum, where the visually impaired children may not be able to learn correctly. 21 (58 per cent) students faced difficulty in displacement of beads. This problem can only be removed through practise on abacus but only 6 (17 per cent) reported that school provided abacus and only 3 (08 per cent) students had their own abacus. In this support Agarwal (2000) stated in her book that unfortunately appropriate tactile material and aids are not readily available in schools to help children in developing fundamental mathematical concepts and skills like counting, concept of shapes, size and spatial relations, measuring computation etc. 12(33 per cent) students agreed that abacus is tough to learn and 15(42 per cent) reported that calculation with abacus is tedious.

### **Conclusion**

On the basis of the findings of this study it can be said that proficiency level in the use of abacus is not up to the mark. Students had little

awareness about the history of abacus and could do little in addition and subtraction. They could not do multiplication, division, decimal and fraction at all. The result indicates that although visually challenged students had satisfactory knowledge regarding parts of abacus and their

functioning, yet their knowledge of basic mathematical operations was very unsatisfactory and disheartening. They were inquisitive enough about abacus and considered it an important device but faced several challenges in learning to use an abacus.

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# Effect on Map Based Learning Activities of the Development of Map Reading Skills among Students at the Secondary Level

SUKHVINDER\*

ASHA KVD KAMATH\*\*

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## Abstract

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*Social Science is one of the compulsory school subjects up to secondary level in India. Teachers use several instructional resources to help children construct knowledge. The classroom environment provides students with numerous opportunities to participate in instruction that incorporates a variety of formats and learning tools. Map is an indispensable tool in social science. However, if maps are to be used correctly by the students, it is necessary that they know how to read maps and interpret them, as maps have their own language. Several skills have been identified by people who worked in the area of maps and they have been consolidated by Wilson (1980). Unless these skills are developed in the students they will not be able to make complete use of the maps given in the textbook as well as to go beyond the textbook- the map related problems which they encounter in their daily lives. Therefore, the investigators wanted to find out to what extent the students of class X have acquired the map reading skills and if it is not acquired at satisfactory level, to organise some map based activities to develop those skills among the students.*

*The objectives of the study were to find the status of acquisition of map-reading skills among the students of Class X; to find the effectiveness of map based activities in developing map-reading skills among the*

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*students; to compare the effectiveness of map-based activities on boys and girls in developing map-reading skills and to find the effectiveness of map-based activities in developing each of the selected map-reading skills among the students. It was a single group pre-test/post-test experimental design. The sample of the study was 27 students (Boys-15 and Girls-12) of Class X following CBSE syllabus. Tools of the study consisted of pre-test, post-test and learning activities prepared by the investigators. The findings of the study were that there is significant difference between pre-test and post-test mean scores. Therefore, the map-based activities have been effective in developing map-reading skills among the students; there is significant difference between the mean scores of boys and girls on the development of map-reading skills. Boys have scored higher mean than girls and though the map based activities have been effective in developing all the six selected map-reading skills, it has been more effective in improving the skills of symbols, map scale, location and inference when compared with the rest of the skills i.e. direction and colour.*

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## **Introduction**

Education is one of the Fundamental Rights and it is free and compulsory in India up to the age of 14 years. It is the requirement of the RTE Act (2009), to provide education to all by sending children to schools. Children are facilitated in schools to acquire knowledge and develop skills which are required by them in order to be responsible citizens of the country. They learn several subjects, including Social Science, which every child is required to study as environmental studies at primary level and as Social Science at upper primary and secondary levels.

At secondary level, the major Social Science disciplines include History, Geography, Economics and Political Science. Teachers use several instructional resources to

help children construct knowledge in the classroom. Well-managed classroom environment provides students with numerous opportunities to participate in instruction that incorporates a variety of formats and learning tools. Use of maps is one type of hands-on activity. Map is an indispensable tool in Social Science. In this regard, David (learnernc, 2014) pointed out that a large number of maps is available for teachers because they can easily find visual resources to accompany lessons in Science and social studies. But, at the same time, it also poses a new challenge for educators, because map is now considered more important than ever before, that students develop map-reading skills as it will offer an opportunity to students to enhance

their learning abilities.

Map reading and interpretation requires certain skills, and so it is a part of visual literacy i.e. a set of skills or abilities to effectively interpret the spatial phenomena, and hence form habits of mind necessary to 'read' images and thus contextualise and link the components on the map with the real world. Bednarz et al. (2006) defines visual literacy as not just decoding an image but comprehending it—grasping the image's intended meaning, evaluating it and incorporating it into other knowledge. They further observe that even young children have more ability than many educators in reading and interpreting maps — both, maps for finding the way and symbolic maps. But unless they receive instruction, their development levels off after a certain point. That leaves them susceptible to misconceptions about maps. Lynn (2008), therefore, recommends that teachers aim for diversity in maps and map functions; link maps to the real world and look for opportunities to encourage map-related activities in the classroom.

However, if maps are to be used correctly by the students, it is necessary that they know how to read maps and interpret them, as maps have their own language. Several skills have been identified by people who worked in the area of

maps and they have been consolidated by Wilson (1980). Kochhar (1999) has identified six comprehensive skills which are required for reading maps. They are— orienting the map and noting directions; recognising the scale of the map and computing distances; locating places on the map, reading map symbols; expressing relative location and comparing maps and making inferences. According to her, 'Map Literacy' is essential for understanding the content of the map and everyone needs to understand map language. A study by Kamath (1998) showed that it is possible to develop map skills among the students of class VIII. However, as there was not much research on the acquisition of map-reading skills among the students at secondary level, investigators analysed the geography textbook of Class X (NCERT, 2007) and identified the skills of direction, colours, symbols, map scale, location and inference as necessary skills to understand the maps given in the textbook. Unless these skills are developed in the students they will not be able to make complete use of the maps given in the textbook and will not be able to effectively comprehend the information beyond the textbook—the map-related problems which they encounter in their daily lives. Therefore, the investigators wanted to find out to what extent the

students of Class X have acquired the map-reading skills, and if it is not acquired at satisfactory level then the investigator attempted to organise some map-based activities to develop those skills among the students.

### Objectives

- To find the status of acquisition of map-reading skills among the students of Class X.
- To find the effectiveness of map-based activities in developing map-reading skills among the students.
- To compare the effectiveness of map-based activities on boys and girls in developing map-reading skills.
- To find the effectiveness of map-based activities in developing each of the selected map-reading skills among the students.

### Design of the Study

It was a single group pre-test post-test experimental design.

### Sample

An intact group of 40 students (24 boys and 16 girls) of Class X following NCERT's textbook was selected for the study. Though all the 40 students had taken pre-test, only 27 students (15 boys and 12 girls) attended all the classes of map-reading and had answered the post-test too. Therefore, the total sample of the study has been considered as 27 students.

### Tool

Three tools were prepared by the investigators:

- Pre-test:** The pre-test consisted of fill-in-the-blanks and short answer type for a maximum of 70 marks. Students were free to take as much time as they wanted as the purpose of the test was to find out how many map-reading skills are acquired by them. The test had items on direction, colour, symbols, map scale and location for 10 marks each and on inference for 20 marks. All the items were based

Table 1

### Design of the Study

Pre-test	Treatment	Post-test
Pre-test on map reading skills for one hour	Treatment for ten classes of 40 minutes duration each. Direction-one class Symbols – one class Colours – two classes Map scale – two classes Location – two classes Inference – two classes	Post-test on map reading skills for one hour



on the maps of Africa. Students had to refer to appropriate maps on Africa in their Atlas and answer the questions. Though they were advised to use Oxford School Atlas-Revised 31<sup>st</sup> Edition, they were also free to use any atlas that was available to them. While correcting the answer scripts, the investigators referred to the atlas used by the students.

- (ii) **Post-test:** The post-test was a parallel test based on the maps of South America.
- (iii) **Activities:** For each of the map-reading skills, the investigators conducted different activities based on the Atlas (Oxford School Atlas, as possessed by majority of the students) referring to the continents of Asia, Africa, North America, Australia and Europe, as they were not a part of post-test. Every student or teams of two were asked to use one atlas. Students had to listen to the guidance given by the investigators, take the help of appropriate maps and complete the learning activity. Students were also encouraged to frame questions for the exercises. They were written on the blackboard. Students were free to approach the investigators any time for help.

### **Treatment**

Based on the performance of the students in the pre-test, the investigators decided to facilitate the students for 10 classes of 40 minutes each towards learning the six selected map-reading skills. As students performed comparatively well in the skills of direction and symbols, one class each was taken to further learn those skills, whereas for learning the other four skills two classes each was taken. The paragraphs below describe in brief the procedure followed by the investigators to assess the map-reading skills of the students.

**Direction:** The investigators hung on the wall the Political map of India. Students identified the direction indicator on the map and drew the same on the blackboard too. Later, referring to it, students either named the direction of a given state or named the state in a given direction as per the question asked by the investigator. After oral exercises in the class, students were given a few fill-in-the-blanks to be filled in by discussing in teams, based on the map of Africa. This was considered as practice exercise.

**Symbols:** The pre-test performance showed that students could read symbols to some extent but they did not know about Conventional symbols, Non-Conventional symbols, Index/Legend/Key. Students

identified conventional and non-conventional symbols on the maps after discussing with them in the class and they also analysed the meaning of Index/Legend/Key which they applied to reading of maps. Later, they were given a work sheet with fill-in-the-blanks and match-the-following, to be worked out with the help of an Atlas. Map of Europe was used for developing the skill of symbols.

**Colours:** Students were able to identify the colours used in the map but the pre-test indicated that many students were not able to read the colours based on the index given in the map. Therefore one class was used to explain how to read colours referring to the index/legend given in the map. A few oral exercises were also done. Another class was used for practising exercises using all shades of colours given in the legend of the map which indicate height of the land above the mean sea level and the depth of water body below the mean sea level. Content was based on the continent of North America.

**Map Scale:** The performance of the students in the pre-test showed that students hardly had any knowledge of Map Scale. The investigators taught the students about graphic scale and statement scale. Discussion was also held on how these scales help in measuring the direct distance

between places. Students tried to find the direct distance between two points, length of the river, road, coastal line etc. using the measuring scale, divider and thread and calculated the distance, length on the ground based on the given scale of the map. Map of Africa was used for developing the skill of using the Map Scale.

**Location:** This is the skill in locating a given place, area etc. in relation to Equator and Prime Meridian in terms of latitudes and longitudes or vice versa. Students practised several exercises on extent of a country, state etc. They also identified the nearest latitude and longitude of a given place and when longitude and latitude is given, students identified the nearest place. Map of Australia was used for this purpose.

**Inference:** This skill involves generalising inference, explaining inference and predicting inference. This can be developed only after learning basic map-reading skills—directions, symbols, colours, map scale and location. In this exercise, in the beginning, a question will be raised by the teacher and students have to respond to it by referring to the appropriate maps. For example, what type of land form is required for growing tea? To this, students will observe a few tea-growing regions in the world, identify

the landform and finally generalise the response. In the same manner they learnt about predictive inference. Map of Asia was used for this purpose.

### **Analysis and Interpretation**

The collected data of pre-test and post-test was tabulated and mean, SD and t-values were calculated. Tables 2 to 4 give the details—

Table 2  
**Mean, SD and t-value on development of map-reading skills**

<i>Test</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>t - value</i>
<i>Pre-test</i>	27	24.85	6.78	3.01*
<i>Post-test</i>	27	34.81	15.81	

\*Significant beyond 0.01 level

Table 2 shows that there is a mean

Table 3  
**Mean, SD and t-value on development of Map reading skills of girls and boys**

<i>Gender</i>	<i>Pre-test</i>				<i>Post-test</i>		
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>t - value</i>	<i>M</i>	<i>SD</i>	<i>t - value</i>
<i>Girls</i>	12	17.25	7.34	1.94*	21.91	7.65	3.30**
<i>Boys</i>	15	30.93	9.47		45.13	13.80	

\*Not significant

\*\*Significant beyond 0.01 level

difference of 9.6 between the pre-test and post-test. The obtained t-value is 3.01. For the t-value to be significant for d.f. 52 at 0.01 level table value is 2.68. As the obtained t-value (3.01) is greater than that, it is concluded that there is significant difference between the pre-test and

post-test means beyond 0.01 levels. In other words, map-based activities have been effective in improving the performance of the students significantly when compared with their earlier performance.

The investigators wanted to find out whether gender plays any role in the performance of the students. Hence, an attempt was made by the investigators to see whether there is significant difference between girls and boys in the development of map-reading skills. Table 3 gives the details.

Table 3 shows that in the pre-test boys have secured higher mean than the girls. But the obtained t-value is only 1.94. For d.f. 25, t-value to be significant at 0.05 level the table value is 2.06. As the

obtained value based on pre-test is less than the table value, there is no significant difference between the girls and boys in the acquisition of map reading skills. But a look at the performance of boys and girls in the post-test shows a mean difference of 23.22 (33.17 per cent). This shows

that boys have performed better than girls. For d.f. 25 the obtained t-value to be significant at 0.01 level, the table value is 2.77. As the obtained t-value is 3.30, it is concluded that there is significant difference between the girls and boys in the development of map reading skills.

Table 2 and 3 show that the map-based activities have been effective in the development of six selected map-reading skills together, among the students. An attempt was made to find out to what extent the map-based activities have been effective in developing each of the map reading skills separately among the students. Table 4 shows the pre-test and post-test mean (in percent) and the mean difference for each of the map reading skills.

Table 4 shows that after the treatment, there has been an

on the skill of inference and next on the skill of location. In case of skills of symbols and map scale, the increase of mean score has been 15.15 per cent and 12.40 per cent respectively. With regard to direction the mean difference is only 4.50 per cent and this may be due to inadequate practice exercises. For developing the skill of colours, though two classes were used it seems to be insufficient to get enough practice in developing the skill as there were different shades of different colours. Therefore, the result is only an increase of mean score by 1.30 per cent, the least mean difference when compared with the rest of the skills.

### Findings of the study

The following were the findings of the study—

Table 4

#### Pre-test and Post-test mean difference of the students on each of the map reading skills (in percent)

<i>Map Reading Skill</i>	<i>Pre-test Mean</i>	<i>Post-test Mean</i>	<i>Mean Difference</i>
<i>Direction</i>	62.55	67.05	4.50
<i>Colours</i>	47.80	49.10	1.30
<i>Symbols</i>	53.90	69.05	15.15
<i>Map Scale</i>	9.30	21.70	12.40
<i>Location</i>	41.05	64.40	23.35
<i>Inference</i>	32.65	64.40	31.75

increase of mean score by 23.35 per cent under location and an increase of mean score by 31.75 per cent under inference. The highest influence of the treatment has been

- There is significant difference between pre-test and post-test mean scores. Therefore, the map-based activities have been effective in developing map-

- reading skills among the students.
- There is significant difference between the mean scores of boys and girls on the development of map-reading skills. Boys have scored higher mean than the girls.
  - Though the map-based activities have been effective in developing all the six selected map-reading skills, it has been more effective in improving the skills of symbols, map scale, location and inference when compared with the rest of the skills i.e. direction and colours.

### **Educational Implications**

The study has shown that it is possible to develop map-reading skills among secondary level

students. Map-reading skills are transferable, and teachers play a pivotal role in developing this skill among the students. Meanwhile, it is also necessary to see that the students are given sufficient time to practise the skills. If possible, self-learning materials may be developed on the basis of a standard School Atlas and allow students to learn on their own with minimum guidance by the teacher. While in the process of developing the map-reading skills or after the development of the skills, they have to be rightly used by the teachers while discussing the map-based content in the class or outside. This will help students to strengthen the acquired map-reading skills.

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# Reflective Teacher

## Pilot Testing of Activity Based Module for Teaching Social Sciences

JAYA SINGH\*

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### Abstract

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*The paper advocates activity based pedagogy for reflective teachers who can reflect upon their practices to ensure equity in participation and concentrate on execution of social justice while transacting the curriculum. The other purpose circumvents around needs for changes found in the mode of teaching which advocates status quo and perpetuates personal prejudices in the classroom. Training for reflective teachers is needed to develop competencies for successfully carrying out reform in the area of curricula so that teachers engage all the students and integrate diversity in the classroom. It is advisable for teachers to engage in an intellectual discourse with their peers to exchange their insight and reflect upon their teaching. It was on this challenge that two modules of activity based pedagogy in economics were tested. The paper attempts to reflect upon pilot testing of two modules which were practised during the training session meant for trained graduate teachers (TGT) in social sciences. The feedback and experiences suggest that the execution of the two modules where the participants engage in discussion, debate and enact critical issues are more successful than the lecture method where the participants sit as passive learners.*

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### Introduction

Dynamics of classroom teaching often portray the teacher-student relationship as a snapshot for social

justice in action. Teachers in general meet a large number of students who differ in terms of their family backgrounds. Diversity is also

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witnessed on social-economic and cultural background and in terms of understanding the language of instruction as well as in meeting the expectations of the teachers.

Teachers certify the basic qualification for teaching and are proficient in the subject knowledge but lack in skill for application of pedagogy (Dalton). The classroom in general follows the cemetery model of teaching where students silently listen to their teachers. Most classrooms have permanent fixed arrangement in terms of organisation of chairs and desks. Blackboards are fixed on the wall and chalks placed near it for the teachers to write as per the requirement of their lesson. This mode of arrangement makes the teaching-learning of the subject unattractive and monotonous for the learners.

Next, teachers in general use the methods adopted by their teachers in classroom, when they were students (Dalton). This model of teaching often overlooks the heterogeneity among the learners. The teachings in the classroom are mostly examination driven where teachers focus on transaction of content. Therefore, the execution of this model acknowledges success particularly in the field of education for learners and teachers, too, feel comfortable

through its regular practise over the years.

### **Pedagogies which a Reflective Teacher Uses**

The use of pedagogy in the classroom facilitates effective teaching. Pedagogy etymologically means “to lead the child”. This cannot happen through conventional teaching-learning method. It is executed through the use of different teaching strategies that encourage students to learn through activity and dialogue. Pedagogy, in addition to learning within the classroom, assists learning for the students outside the school. Teachers’ awareness regarding the usefulness of pedagogy enables her to reflect upon alternative methods of teaching. Various components of pedagogy include teacher-student interaction, classroom organisation through change in the setting of chairs and desks, time management, designing of activity, expectation and value attached to teaching and learning in the classroom. Use of such pedagogies in the classroom can help teachers to ensure students’ participation in teaching-learning and enhancing their performance through the use of a variety of activities. Thus, the importance of pedagogy lies in transforming the teaching through interactive model and support activity based teaching.

**Classroom observations – Case 1**

The school has reopened after the vacation. Miss X can be heard explaining the meaning of globalisation in the classroom. At times she shouts ‘pay attention in the classroom’ as there will be tests in the second period. The threat of the test reduces children’s noise slightly and they start whispering among themselves. They copy what is written on the board. They listen to their teachers attentively with their eyes centered on her.

She distributes blank sheets to the students at the beginning of the second period. She writes questions on the board and students copy them on the sheets provided to them. She asks students to attempt all the questions or receive a zero. Students quietly bow their heads over the sheet and start writing the answers. When the bell rings they hand over the sheet to their teacher and rush out of the classroom.

The test (mentioned in the box) was content-driven and supported by information given in the textbook. Students regurgitated the information provided to them in the classroom and scored high marks. This kind of teaching provides information to the students and grades them as per their memory based performance in the examination. Here it is evident that students are not able to connect school knowledge with their understanding and experience about their environment outside the school. There was no reflection upon

the issues and concerns attached to the phenomenon of globalisation. The students may not be able to apply received information in real life situations.

The fear of the test assured attention of the students in the classroom. Students listened to teachers in the classroom as they had to respond to the test as a follow-up of the teacher’s lecture. As evident, in the absence of appropriate pedagogy the teacher had to accept blank stares and silence in the classroom. Students’ minds were not activated in their zone of learning. In an inquiry with a high scorer student it was found that he was not able to relate the concepts with real life situations even though he scored high marks.

Reflective teacher uses the pedagogy that will complement and strengthen her teachings. The use of multiple pedagogies provides an opportunity to the students to learn through engagement with the topic or concept. Teachers then find it comfortable to assist students in their zone of learning. This requires planning and learning from their experiences acquired over the years. Here, she has to make use of numerous activities and practice sessions to introduce students to the concepts, skills and apply the same in their real life situations. She needs to use different pedagogies in the classroom to increase her face-to-



face contact with her students and provide activities to ensure participation of all. The students need to be sensitised to the challenges of discrimination, stereotyping, marginalisation in the classroom so that they can protest in situations of oppression.

### **Objective**

In view of exploring due effectiveness of reflective teaching-learning in the classroom context, pilot testing of two activity-based modules was undertaken. The objectives of this pilot testing are :

1. To explore the issues and concerns of reflective teaching practices in the teacher education programme.
2. To provide in-service teachers an exposure to reflective teaching-learning practices based on content-cum-pedagogy modules embedded with equity, activism and social literacy.

### **Methodologies**

In order to accomplish these objectives, teachers and subject experts were consulted, classrooms were observed and literature was reviewed for the development of modules in social sciences. Field experiences of a school in Shimla have also been taken care of in these modules.\* NCF 2005 holds that practices advocated in the in-service education can play an important

part in the professional growth of teachers. Teachers can, thereafter, function as an agent of change in school related practices. The teacher when being conversant with the new practices advocated in the orientation session can affirm their practice in the classroom.

### **About the Modules**

These modules were implemented in the in-service training imparted to the teachers of Rajasthan, Bihar, Haryana and Delhi. The five-day training programme included teachers from both private and public schools.

The modules include practices and perspectives on content cum pedagogy and reflect upon the dialectical relationship between theory and its application in real life situations. It challenges stereotypes that are evident in terms of structural inequality and discrimination based on race, gender, class and other socio-cultural differences. It enables learners to access resources on an equal footing particularly emotional resources which strengthen belief in their worth and ability. The third major component refers to tapping and strengthening of innate talent. Last but not the least it creates a learning environment that promotes critical thinking among the teacher and student thereby act as an agent for change.

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\*The author of this article taught for three months in a rural school in Shimla in 2013-14.

### **Theoretical perspective evolved through survey of literature**

A few literatures are referred here to affirm to the practices evolved for reflective teaching. There is a need for discussion on them to support our development and pilot testing of modules.

### **The Discovery Approach—Bruner**

Bruner propounded the cognitive model of learning for improving the strategies of learning in the classroom. He advocated use of discovery approach in the school by the learners. The subject matter should not be presented in the final form before the students. Rather, the content should be organised in such a manner that students are able to discover the relationship between the content and events. The advantage of self-discovery enables such learning that facilitates transfers and retention which increases problem-solving ability and motivation among the learners (Bruner 1961).

### **Vygotsky's Socio-Cultural Theory**

Vygotsky also believed that children are active seekers of knowledge; he however held that cognition was a collaborative effort of child and socio-cultural environment. His two crucial pedagogical techniques are 'discovery method' and 'cooperative learning'. In discovery method the

role of the teacher would be to facilitate children's learning with explanation, demonstration and verbal prompts based on child's 'zone of proximal development'. Co-operative method propagates learning through dialogue between teachers and pupils while engaged in teaching-learning in the classroom.

### **Need for Education of Reflective Teachers**

Bruner, in his book *The Process of Education*, states that the general objective of education is to cultivate 'excellence'. Excellence does not mean to look for students who can score high marks in the examination. Here excellence can be determined when any teacher reflects on her classroom teaching and makes it joyful for children with different abilities. This also means special effort have to be made, like use of pedagogy, while transacting the curriculum in the class as the level of understanding varies from student to student. In the absence of such effort, students who are not at par with others at learning levels, when not given due attention may be thrown out of mainstream education. On the other hand, if all students are helped to make optimum utilisation of their abilities, then the chance of equal participation in the classroom may survive over other exclusive methods of teaching the subject.

With the change in policy for

participatory learning, the textbooks developed as per the guidelines of National Curriculum Framework (NCF 2005) systematically incorporated the pedagogic standards in the context of classroom teaching-learning. Teachers who are conversant with the lecture method of teaching look for a paragraph which can be memorised. The change in the paradigm calls for orientation for reflective teachers to access new information, multiple ways of transaction of the curriculum and also creating situations for the construction of knowledge by the learners in the classroom. The teacher needs to work upon several trajectories to shift from information loaded teaching towards scientific interpretation of ideas. The reflective practitioner then tends to discover the dichotomy that exists between the child and the curriculum and provide for linkages with its application in real life situations.

It has also been felt that one need not grasp only principles and theories, for understanding a particular subject. One even needs to build upon attitude towards learning and inquiry, making wild guesses towards possibility of solving a problem. For example, scientists who believe in 'orderliness of nature', work with convictions that orders can be discovered. Similarly, young learners with similar attitude need to organise their learning in such a

way as to make it usable and meaningful in their thinking. To instil such attitudes, one requires something more than mere teaching-learning of the fundamental ideas. Teachers need to reflect to be able to generate a sense of excitement about discovery along with confidence in one's ability.

#### **Classroom Observation – Case 2**

The bell rang for the third period and miss Y entered the classroom. There was silence in the classroom and students were seated on the seats allotted to them. The teacher while teaching in the class asked a question and expected students to find an answer. She does not rebuke anyone, rather ensures their comfort and allows them to make wild guesses about the topic. She allows the participation of maximum number of students in an attempt to find an answer to her question. She does not agree with the answers given by the students. 'Not correct', 'Wrong' are her replies for the responses given by the students. At the end the correct answers are dictated by her in the class and the students tend to copy them in their notebooks.

Here also another type of pedagogy was used where the students got the opportunity to discover answers for themselves.

Students on their own do not volunteer to answer her question although she makes them comfortable enough to stand and make an attempt to make wild guesses. However she did not follow the constructivist approach throughout the class. She started evaluating students' answers and passing judgement. Rather than saying 'wrong' and 'right' to students' replies, she should encourage them to engage in a dialogue where they can question their friends as well as their teachers in the classroom. Students could have discovered the correct answers through dialogue and discussion in the classroom. Here, too, teaching was unidirectional as teacher did not appreciate various responses shared by students in the class. At the end the only reply given by the teacher had to be universally accepted. The notes were dictated in the classroom, which leads to rote memorisation. This system of teaching-learning of the subject promotes teacher-dominated classroom. Such teaching which believes in filling up of passive learner's mind, assumed to be an empty vessel, by strenuous effort of the teacher is dull and boring. It is no wonder that contemporary educational reform favours the replacement of teacher-dominated teaching with a different method where students are more explicitly involved in their own learning.

Students can clarify their doubts and teacher should respect the views of the students rather than following strict norms of silence in the classroom, students would then find the classroom a livelier place to relate them and for teachers, too, teaching can become an adventure of interesting minds. Such an environment will ensure self-confidence and self-esteem among all the learners and help in improving quality of learning in the classroom.

Reflection is an excellent tool to keep oneself in tune with what one needs to practise in the classroom. A reflective practitioner determines her attitude towards her students and builds positive relationship with the students. He/she continuously improves himself/herself, filling up self-identified gaps in his/her teaching.

### **Towards reflective subject-specific teaching-learning**

Economics has been introduced as a composite part of social sciences since Class 6. At this stage, Social Science has been introduced for the students to give them an idea of the subject without much focus on their disciplinary qualities (NCF 2005). The teachers in general are not comfortable with four subjects to be handled within the ambit of Social Sciences at the secondary stage. Some of them find difficulties in handling topics in economics as they

are not comfortable with the basics of Economics. Their classes, too, do not engage students through the use of pedagogy. Two modules in economics have been used in the training programme to help the teachers in the transaction of the Economics curriculum.

There are three reasons why Economics needs to be taught through different method evolved through reflective process of teaching learning of the subject :

- (i) There is a growing appreciation of the psychological basis of learning
- (ii) A reinterpretation of what knowing economics means for the classroom.
- (iii) The development of new ways of looking at educational aims and objectives in relation to the subject

As regards the psychological basis of learning, there is a need to gain the attention and interest of the learners, which has always been realised intuitively by good teachers. But psychological research has underlined the importance of introducing more pedagogy into teaching of the subject in order to stimulate critical thinking. Equally important has been the need to ensure the learners' active participation in the learning process. This needs experimentation and

discovery of what is being learnt. Here teacher's main concern relates to shifting towards a more learner oriented conception of the task in the classroom. For example in case of Economics classroom, the selected resource material such as statistical table, use of diagrams and graphs, case study, role play, debate, discussion open up immeasurably the possibility of inductive inquiry based teaching-learning of the subject.

Reflective thinking prior to the transaction of the lesson enables teachers to participate in a way which is less centered on her and encourages student's participation in the class. Understanding of any subject necessitates dialogical relationship between the teacher and the student who should see the relevance of the subject for themselves.

Economists like Keynes believe that understanding the content does not define the subject rather it is the method 'apparatus of the mind and a technique of thinking'. One of its purposes is to optimise the allocation of scarce resources for alternative uses. For example the objective of providing shelter for poor may also mean diverting resources or discouraging building of large houses through the imposition of high tax on such buildings.

### **Case of a Migrant Population**

Let us understand this concept through the case of migrant population in an imaginary country X. Immigrants in different parts of the world have been accused of reducing the wealth of the host country. Looking at this, Governments of such countries have laid severe restriction on migratory population. For example, migrants in X country have been accused of draining the wealth of the host countries. This accusation is made because they tend to send their earnings to the family members residing in the country from where they have come. This is not true as these migrants contribute in the growth of an economy where they are working at the moment. They tend to produce goods and services which have been highly valued by their customers. Customers desire to purchase them for they are cost effective. In fact, the immigrants in X country have added to the wealth of both the countries. Restriction, thus, should not be imposed for free movement of labourers from one country to another. Migratory population, too, should be given equal civic rights.

Similarly, as in many other cases, the economic logic is simple and uncomplicated. It is a myth and misconception which tends to complicate understanding of the subject. Thus, the study of the subject should begin with the wonder

where learners are provided with a basic understanding of how things function. This necessitates in-service teacher education through a module with integrative perspectives of content, pedagogy and social concerns such as equity and social justice. This tends to enhance students' participation in the teaching-learning of the subject. In the aforesaid example, had teacher taught students through lecture method, students would have learnt that immigration tends to drain the wealth of any country. However, on discussion, the students looked at the pros and cons of the topic and that helped in the holistic understanding of the topic.

### **Module 1 (Pilot testing)**

This module is based on the topic on 'Globalisation' drawn from the Economics textbook. The module covered various aspects of globalisation i.e what is globalisation, what are its features and its positive as well as negative impact on the economy. Here it is assumed that learners are not conversant with the key idea behind the process of globalisation, integration of market, and its impact upon the economy. Reflective teaching enables the learners to grasp the idea with clarity and relate it with their previous understanding.

It was not easy for the instructor to start the discussion as the group

was not familiar with this approach. Here the important consideration was selection of the topic to ensure their familiarity and facilitate interaction among them. Before conducting the debate there was a need for reflection on preparation for the conduct of debate. In the case of Rajasthan, the instructor made an effort to mould the discussion from India towards their own economy. The topic for debate thus read as 'Impact of globalisation on the economy of Rajasthan'. Each participant got an opportunity to voice his/her views in the discussion.

There was another important concern in terms of motivating the participants who were too shy to contribute to the discussion. There were still some who were dominating the groups with their arguments.

A free and uninhibiting environment is a necessary condition for the conduct of discussion and debate. The instructor, therefore, had to ensure that there is guidance and monitoring to avoid aimless discussion. In the absence of monitoring, the debate then centres around baseless arguments without incorporating reflective thoughts in the discussion. Learners actually learn by adding new information to what they already know. In this case the emphasis had shifted from India to their own place Rajasthan, and relating the understanding of economics to the real life situation.

The argument then provided insight into the nature of decision-making, problem-solving and other such issues encountered in their day-to-day lives. It enlisted the learner's power of introspection in order to understand economic implication of the motives and actions of others. Here, in this case the actor developed the understanding not simply of their individual roles but also of interplay among the peer groups.

Here, the conduct of debate can be characterised by an exchange of arguments and views among participants. The exchange of views also includes the question-and-answer session within the groups. In fact, the participants were charged to the extent that there was a flow of arguments, different questions outpouring from all the corners of the classroom. In this mode of engagement, the information and argument flows from powerful to the powerless, from the informed to the less informed. The emotion, too, came through as was evident in the tone and pitch of the participants.

This type of activity promotes peer learning as students become aware of strong and weak points of each other. At times students themselves negotiate a balance in participation wherein students with high level of participation make room for students with low level of participation. In the end summarising the main point would add to the

quality in the classroom instruction. The participants in the end agreed that questions and arguments signify productive outcomes of learning and understanding the subject.

The participants gave a positive feedback about this module. 'It challenges one's thinking and learners can look into the pros and cons of any topic/phenomenon'. 'The discussion in the group is so enlightening that even the uninterested participant in the class felt challenged and started participating in the debate'. She too was interested and ready to contribute in the class without much persuasion. Debate of this kind often solves the difficulties, clarifies the concepts, and problems are resolved through discussion. Participants while arguing for their points acquired useful skills such as problem solving, decision making, and engagement in critical thought with each other. Reflective teachers will feel satisfied in the classroom since there is active teaching-learning among the students.

### **Module 2 (Pilot testing)**

The second module was taken to transact another topic on 'Consumer Rights' from the Economics textbook. There has been discussion on the role of two institutions i.e market and State in any economy. In some economy market plays a dominant role whereas in the other, the state decides major activities regarding what should be produced, how it should be produced and its

distribution among the masses. In case of mixed economies both the institutions maintain a balance by keeping a check on each other. For example, if there is exploitation by the market then the State is expected to curb its malfunctioning through the enforcement of rules and regulations.

Role play is an interesting pedagogical tool for enactment of course content that stimulates students' learning. They bring problems for discussion into the classroom through the enactment of real-life situation. In this case the participants enacted the five rights granted to the consumers, i.e Right to be informed, Right to safety, Right to choose, Right to seek redressal of grievances and Right to represent. This module stimulates the kind of situation in which learners are likely to apply their basic understanding of economics to real-life situations.

The role play challenges the learners to apply theories learnt in the textbook to the real life situations. The participants were divided into five groups and were given only 10 minutes for preparation. The story was discussed in a team and members volunteered to play the role as per the character in the story. Some of the participants were hesitant to act on the stage. Encouragement from the team motivated them and they agreed to act on the stage. Role play to be



effective needs coordination among the team members in the absence of which there cannot be enactment of a story. The message of the story needs to be communicated among the learners. It can be performed at any time for it does not need any technology.

Role play helped the participants to explore the rights of the consumer. There was a dual purpose to achieve (i) understanding of real life situation being simulated to develop skill through participation (ii) reflective activity when enacted tends to hold learner's attention. It helped to create insight into the nature of decision-making, problem-solving, and other issues encountered in their day-to-day lives. It enlisted the individual power of self introspection in order to understand economic implication of the motives and actions of others. Here in this case the actors developed the understanding not simply of their individual roles but also of interplay among the peer groups.

A teacher can facilitate understanding of new topics in the classroom through role play where students can use their experiences at home and school. She can equip and inspire the students to understand issues that affect them or others in their community. The enactment of the topic raises common concerns which can be dealt with under the norms of

participatory democracy. This activity is helpful in addressing the issues of social inequality and helps to raise the students' voices in the classroom. Its practice in the classroom can build evidence for research study where learning the content and social justice can be complementary goals.

The participants expressed interest in the conduct of role play. The role play is inspiring as well as entertaining'. 'It was inspiring for it showed how valuable a role play can be in boosting learners' confidence and ensuring their creativity while performing the role". 'It was interesting to see how participants wrote the scripts and performed them confidently within the short span of time'. Enactment of such role helps to build interpersonal skill, assures equal opportunity in a group, builds team work, encourages initiative and motivates self-learning. The implication of enactment of such roles in the classroom changes the role of the teacher to that of the facilitator. The classroom atmosphere becomes vibrant and cordial.

## **Conclusion**

The integration of content and pedagogical process refines the practical skill of problem solving, decision making, critical thinking and peer learning. In the teacher education programme there is a need to cover the content from the textbook but the major issues of equity, activism and social literacy

should also be addressed. Use of pedagogy in the classroom provides an opportunity for participation especially for linguistically and culturally diverse students. The task of teaching necessitates the integration of multiple pedagogies so that it generates interest for the learners and also responds to the need of individual students. There is a significant relationship between high level of participation and modules advocated in the paper.

There is a need to integrate content with the help of transformative pedagogy so that this helps in understanding the real life situations. If curriculum intends to inculcate the value of social justice in students, then rather than giving content as theoretical prescription, practising multiple pedagogies for ensuring participation of all the learners in class is essential for a teacher.

# Ethical Discourse in Science Textbooks

## A Study of Class 12 Biology Textbook

ASTHA SAXENA\*

ALKA BEHARI\*\*

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### Abstract

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*Textbooks play a pivotal role in informing and educating but sometimes the content presented within a textbook is only partially correct or presents the ideology of the dominant few. This could lead to a distortion of some topics given in the textbook. Sciences bear the onus to inform about the creation and application of a particular technology, which help in enhancing the self-sufficiency of a nation whereas ethics decide the course a particular research takes by analysing its impact on society. Hence, technology sans ethics can lead toward unbridled technological growth which has been disastrous. In order to bolster the relevance and place for ethics in science and technology, the beginning has to be at the level of education. The research questions that guided the present study were, how is this technology component represented in the present science education both in its curriculum and practice, also, whether ethics or ethical principles find a place in the present science curriculum or not. In the light of the above questions, the present paper attempts to analyse the class 12 Biology textbook with respect to the inclusion of ethical issues with respect to some recent biotechnology within it along with teachers' perceptions about the current textbook of Biology. The study analyses three science and technology issues viz., amniocentesis, in-vitro fertilisation and genetic modification of organisms. A content analysis approach has been adopted for analysing the selected text sample. The paper then elaborates upon the ethical stance taken by the author within the textbook and corroborating it with the relevant ethical theories and modes of inquiry. The findings reveal that the positive impact of the*

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*technology component of class 12 Biology textbook is what is being highlighted while neglecting the major debates associated with gender equality, human rights, food safety and other ethical concerns. The in-depth interviews with the teachers unveiled their apprehensiveness in dealing with the ethical issues. Implications are broadly drawn for textbook writers, curriculum developers, policy makers, teachers and teacher educators.*

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## **Introduction**

Science textbooks are one of the chief translators and a tool for transacting the course content used in the majority of science classrooms in the Indian subcontinent. They are being treated as sacrosanct both by the teachers and students alike without any inkling of a doubt or misrepresentation that prevails many a time in the textbooks. The objectives for teaching any topic in the classroom are being decided by keeping the textual content in mind without even bothering about extending student understanding towards certain broader humanistic aims. These include the aim of a scientifically literate citizenry which is not just aware about the scientific terms and terminologies but also able to reach an understanding up to the application level in solving real-life problems (problem-solving approach). One of the broader aims of science and technology education is also about having the ability to discern and take wise decisions vis-à-vis a particular technology such that it is used for the welfare of human society and not for its

detriment (NCF-2005). This is possible only when the students are able to differentiate between what is right and what is wrong and how do we reach that conclusion (process of ethical inquiry). However, there are no set guidelines provided in the document for achieving this goal but have to be communicated via the curriculum, syllabus, textbooks, teachers and their pedagogy. The present paper focusses upon the role of textbook in addressing such issues of ethical concern that impact our society. For this purpose, some selected texts from the class 12 NCERT textbook of Biology have been taken and analysed.

The aims of the present study are: (i) Developing a theoretical framework for the analysis of textbook content with respect to inclusion of ethical issues in class 12 Biology; (ii) Content-analysis of class 12 Biology textbook with respect to the inclusion and representation of ethical issues within it; (iii) Deriving implications for textbook writers, curriculum developers, science teachers and teacher educators.

### Background of the study

The present study derives its significance from the recent spurt in researches that have tried to establish strong interlinkages between sciences and ethics by way of socio-scientific issues (Reiss, 1999; Goldfarb and Pritchard, 2000; Zeidler and Sadler, 2008). It has now been well-established that ethics form an indispensable component of sciences and science education. Therefore, the curriculum has to provide adequate space to this component of sciences so as to inform and emancipate science education from a mere materialistic bent towards a humanistic aim. The textbooks are the chief translators of the curriculum and are a direct reflection of the state's educational policy. Hence, the content given in the text is determined and decided keeping in view the greater picture of the state and its citizens. India being a developing nation has to

have a major share in the industrial and technology sector so as to expedite its process of development. This is reflected in the science curriculum that has a renewed focus on the technology component so as to initiate and inspire the young minds in this field. But, giving them a content that is unidimensional and written with some prior assumptions will be akin to misguiding our young learners. They need to be informed about the complexity of a particular issue and not just one popular notion. However, the present textbooks digress from taking such an approach, which is as difficult to present as to understand.

A review of the recent trend of studies in the area of textbook analysis has revealed that not much work has been done with respect to analysis of this ethical component within science textbooks. (See Table 1)

Table 1

### Review of Studies Related to Science Textbook Analysis

S. No.	Researchers (Year)	Area of Research
1.	Koulaidis and Tsatsaroni (1996)	A study of relationship between scientific knowledge and school knowledge
2.	Morimoto & Maeda (2002)	Inclusion of appropriate experiments for students within the textbooks and illustration of students' activities in higher secondary Biology textbooks
3.	Chiappetta and Fillman, (2007); Brooks (2008)	Inclusion of nature of science component in school science textbooks

4.	Delgado (2009); Morning (2008)	A study of Textbook adaptation while addressing multiculturalism in science education and construction of race
5.	King (2010)	Prevalent misconceptions and oversimplifications in high school science textbooks
6.	Kahveci (2010)	Studied gender equity, questioning level, science vocabulary load, and readability load in science textbooks by using certain standardised procedures
7.	Teixeira et al (2011)	Did a content analysis of the high school Biology textbook with respect to the addressal of nutritional issues contained in it
8.	Nonaka et al (2012)	Analysed the content of secondary school Biology textbooks regarding the treatment given to the topic Malaria and its control
9.	Udeani (2013)	Adopted a quantitative approach to analyse the content given in a particular text, such as with respect to scientific literacy themes

This all the more increases the need for such a kind of study as ethical issues have recently acquired a predominant role in the area of science education. Therefore, we in our present study decided to take this notion further by analysing the high school textbook of Biology with respect to the inclusion of ethical issues and the treatment given to them therein.

### **Theoretical Framework**

The present study derives its theoretical basis from the three main ethical theories, viz., Virtue theory, Consequentialist (Utilitarian) theory, and Deontological theory. A brief description of each of the aforementioned theories along with their

application forms the major portion of the theoretical framework so as to build an orientation towards these theories.

Firstly, the *virtue theory* based on Aristotelian ideas focusses upon the predicative nature of what is good rather than its attributive character (Graham, 2011). As is argued by philosophers working in this area that a predicative nature is more descriptive about the character rather than the attributive nature.

The *Kantian ethics* or what we call more appropriately 'Ethics of Good Will' or deontological ethics transcends the virtue ethics and rather than an innate quality of any subject or object gives more importance to the action and the

intention behind it. Thus, even good qualities such as intelligence, wit, judgement etc., can result in an unfavourable, rather harmful, action if misused (Kant, 1959). Thus, in Kant's viewpoint actions hold a supreme value and have the capacity to determine whether a particular act is moral or immoral. Developing and nurturing a 'goodwill' in Kantian terms means holding and abiding by certain duties that Kant defines as 'Categorical Imperatives' and that are beyond our wants and desires. The major critique of this theory is the sole reliance on duty as well as a complete disconnect with the consequence or result. For any act to be moral at least some positive outcome is to be required.

This gave rise to another philosophical doctrine called **Utilitarianism** (founded as a moral theory by Jeremy Bentham), meaning the social utility of a particular action resulting in happiness (Bentham, 1960: page no. 126). The major focus of utilitarianism lies with the amount of happiness that a particular action brings about. Utilitarianism is often confused with **Consequentialism**, but both are actually very different and have distinct approaches. Utilitarianism is more of a hedonist approach whereas Consequentialism concerns itself with some higher aims and aesthetic rewards as compared to a shallow happiness.

Thus, the above-mentioned ethical theories provide us with a brief idea about the basics of ethical mode of inquiry into any issue and also at the same time leaves us with a dilemma as to which theory is completely foolproof. However, such a decision is highly subjective and depends upon individual values and assertions. Such an understanding can only be gained via ethical discourse wherein different viewpoints and theoretical justifications are argued and put together to arrive at a consensus. 'Ethical decision-making' is another area that is being researched upon in recent years, especially in issues from day-to-day life and those in the arena of technology and applied Biotechnology. In order to arrive at an informed understanding with respect to these issues, a person should have a sound knowledge base in the area of STS (Science, Technology and Society) as well as a brief idea about ethical theories for resolving such issues and taking the appropriate decisions. How is the present generation of science students guided in this direction? Was the major research question lurking before us that prompted us to write this paper?

### **Research Methodology**

The content analysis approach has been adopted in order to analyse the content of class 12 NCERT Biology

textbook with respect to the inclusion of ethical issues within it. The research method used will involve critical content analysis of the text with respect to the ethical issues in Biological Sciences. In-depth interviews with ten high school Biology teachers teaching the present Biology NCERT text will also be simultaneously included and analysed so as to get a peep into the prevailing understanding of the ethical issues that the text tries to build up. The following procedure for content analysis has been adopted for the present study.

**Sampling of relevant text**—The part of the text which is taken for the present study is the selected portions pertaining to some emerging technologies which have both a beneficial as well as a controversial side in terms of certain ethical issues attached to their application and impact on the society at large. For the present paper, only three such technologies will be taken up, viz., Amniocentesis, In-Vitro Fertilisation (IVF) and Genetic Modification of Organisms (GMOs).

**Development of Codes and Categories**—Based on our prevailing understanding about ethical issues pertaining to some contemporary technologies, such as IVF, Gene Therapy, GM crops and even when it comes to conservation of natural resources some codes and categories

were developed by the researcher. Thus, the present study involves a pre-coding scheme of analysis where codes are developed prior to conducting the actual content analysis.

**Coding and presentation of textual data**—Based on the codes and categories developed the textual data was coded and analysed and the codes were assigned to the selected text. A grid was developed for each topic/issue analysed wherein details about the type of ethical issue, its category number, broad area, length of issue covered in the textbook, reference to any ethical theory, number of arguments raised, and kind of understanding being fostered have been given. This helps in getting a quick view of the kind of treatment given to a particular topic/issue within the textbook.

**Analysis and Inference**—Based on the coding analysis, a brief idea about the depth to which a particular issue has been dealt within the textbook was generated. Next, the major arguments given in the text were selected as evidences for highlighting the stance taken by the author with respect to a particular issue. These were then analysed in the backdrop of the major ethical theories taken from the theoretical framework of the study developed by the researcher.



## Results and Findings

Using the method of content analysis, the selected text-samples from the class 12 textbook of Biology were coded and analysed. The following were some of the findings and interpretations that emerged from the study with respect to each text sample analysed.

### 1. Sex-Determination and

**Amniocentesis**—The issue has been covered in the chapter on ‘Reproductive Health’ in just about thirty-two words, stating it as,

*“Statutory ban on amniocentesis (a foetal sex determination test based on the chromosomal pattern in the amniotic fluid surrounding the developing embryo) for sex determination to check increasing female foeticides, massive child immunisation, etc.” (code 2.1.2) (Source: class 12 Biology Textbook, 2006, p.58)*

Type of Ethical Issue	Medical Technology and its Misuse
Category No./Code	2.1/2.1.2
Broad Area	Reproductive Health
Length of issue covered in textbook	32 words
Reference to any ethical theory	None
Arguments raised	One
Kind of Understanding Fostered	Factual

Figure 1: Presentation of the issue of Amniocentesis in Class 12 Textbook of Biology

Upon carefully scrutinising and deconstructing the above text the point that emerges is that the technique of amniocentesis is being misused for foetal sex-determination and leading to increasing numbers of female foeticides. However, this is also the ethical argument being posed in the text. From the above text it can be inferred that the increasing incidence of female foeticide needs to be checked which is also a reflection on the unequal status of women in Indian society (Code 2.1.1) but the text does not discuss this issue in detail. Such a stark statement is an indication of the patriarchal system (code 2.1.3) and a never-ending craving for a male heir. This also indicates the weaker position that the fairer sex holds which in any way is a big question upon the democracy of a state like India. The woman who gives birth to a child does not have a say when it comes to deciding the fate of her unborn child.

**Ethical Basis:** The text fails to provide any ethical grounding for such an issue which could be the principle of equality of gender (code 2.1.1) as per which both male and female should receive equal human rights. The right to life is one of those inalienable human rights which is the right of each and every human individual irrespective of gender, class, creed, religion, or region (code

2.1.2). This statement however does not try to undermine the medical diagnostic value of the test, which helps in predicting any kind of foetal disorder, but the ethics lie in using this technique just for diagnosis and not for sex-determination. Banning the technique altogether is not going to improve the skewed sex-ratio, rather an ethical understanding of wisely using the technique can, and it is the responsibility of the medical professionals to follow a code of ethics (Code 2.1.4) in their profession by not divulging the sex of the foetus while carrying out this kind of test.

## **2. In-Vitro Fertilisation (IVF)**

The textbook introduces the issue as a repair mechanism for infertility by offering a medical technology that can overcome this problem. Somewhere the textbook presents the technique as a way out to prevent the female from being stigmatised for her inability to bear a child by saying it clearly that the problem could be with the male partner.

**Evidence 2a.** *“In India, the female is often blamed for the couple being childless, but more often than not, the problem lies in the male partner.” (code 2.4.1) (Source: Class 12 NCERT Textbook of Biology, p.64, 1<sup>st</sup> para)*

The different kinds of medical interventions in this regard have been taken as embryo transfer technique, zygote intra-fallopian transfer (ZIFT), gamete intra-fallopian transfer (GIFT), artificial insemination (AI), etc. although the technicalities of all these techniques have been discussed (code 2.4.4) but what the present textbook lacks is the whole set of ethical issues associated with these techniques of assisted reproduction. Only towards the end of the topic, the textbook refers to the point of social inequality amongst people in a country like India that prevents them from having access to such a treatment.

**Evidence 2b.** *“Though options are many, all these techniques require extremely high precision handling by specialised professionals and expensive instrumentation. Therefore, these facilities are currently available only in a few centres in the country. Obviously, their benefits are affordable to only a limited number of people.” (code 2.4.5) (ibid., p.64, last para)*

This creates a divide between haves and have-nots. The principle of Equality becomes the issue of concern and demands equal distribution of the fruits of technology to all the people.

<i>Type of Ethical Issue</i>	Medical
<i>Category No./codes</i>	2.4/2.4.1, 2.4.4, 2.4.5
<i>Broad Area</i>	Reproductive Health
<i>Length of issue covered in textbook</i>	1 Page
<i>Reference to any ethical theory</i>	None
<i>Arguments raised</i>	One
<i>Kind of understanding fostered</i>	Conceptual

Figure 2: Presentation of the issue of IVF in class 12 textbook of Biology

**Ethical Basis:** Although the in-vitro fertilisation (IVF) technology is a medical innovation and an example of cutting edge creativity, every good thing comes with a cost, and so with this technology. The major ethical issue lurking here is the destruction of many fertilised eggs or embryos which are either wasted or frozen for further usage (code 2.4.2). In the United Kingdom under the Human Fertilisation and Embryology Act (1990), human embryos can be kept in frozen condition only up till five years, after which they must be either used up or destroyed. This destruction of human embryos is being regarded as an extremely immoral act, as according to some people human embryo possesses an equal moral status as any foetus, child or adult (Levinson and Reiss, 2003) and therefore should be protected. Another ethical issue in in-vitro fertilisation is its use even

by the fertile (code 2.4.3), such as single parent family, delayed motherhood or post-menopausal motherhood, same gender couples, etc. These practises generate many ethical issues, such as what would happen to the children born to such parents, will they have a normal childhood, will their capacities be fully nurtured and developed? Here the principle of Utilitarianism prevails, which favours the act that leads to wellness and happiness to all. And an act such as in-vitro fertilisation and further development of embryo till term is a highly responsible act and hence the consequences should be well thought of. Only after weighing the pros and cons of the technique should it be practised. However, both these ethical issues (codes 2.4.2 & 2.4.3) do not receive even a slightest mention in the textbook and thus portray only the beneficial side of the technology of IVF which fosters only a partially correct understanding in the reader's mind.

**3. Genetically Modified Organisms (GMOs)** – These include both genetically modified plants as well as animals. These are included in the chapter on Biotechnology and its Applications (Chapter-12, Section-12.1, 12.3 and 12.4). The following grid provides details on some of the aspects of the way the topic has been dealt within the textbook.

Type of Ethical Issue	Socio-economic and Therapeutic
Category No./ codes	3.1& 3.2/ 3.1.1, 3.1.4
Broad Area	Biotechnology
Length of issue covered in textbook	3 Pages
Reference to any ethical theory	Utilitarian
Arguments raised	Utilitarian, socio-economic and therapeutic arguments are being raised in favor of GMOs. Some legal and biosafety arguments are also raised
Kind of Understanding Fostered	Ethical Dilemma

Figure 3: Presentation of the issue of GMOs in class 12 textbook of Biology

The text portrays the technology as useful and beneficial for mankind and provides many arguments for it such as,

**Evidence 3(a):** “GM plants have been useful in many ways. Genetic modification has:

- (i) Made crops more tolerant to abiotic stresses (cold, drought, salt, heat).
- (ii) Reduced reliance on chemical pesticides (pest-resistant crops).
- (iii) Helped to reduce post harvest losses.

(iv) Increased efficiency of mineral usage by plants (this prevents early exhaustion of fertility of soil).

(v) Enhanced nutritional value of food, e.g., Vitamin ‘A’ enriched rice. (Source: Class 12 Biology Textbook, 2006, p.208)

In addition the use of genetically modified organisms in making genetically engineered insulin and in gene therapy has also been discussed in detail. (ibid. p.210-213)

Within the text there are evidences that point toward the ethical discourse that is inherent within these technologies, such as the following sentences quoted directly from the textbook.

**Evidence 3(b):** “Genetic Modification of organisms can have unpredictable results when such organisms are introduced into the eco-system.” (code 3.1.1) (Source: Class 12 NCERT Biology Textbook, p.213)

From the above statement the author is showing his/her concern towards the unknown impact that a genetically modified organism can have on the environment. Here the unprecedented outcome or consequence that such a technology purports to have can have both a positive or a negative dimension. But, the concern is more toward the negative outcome as it hampers the human existence and sustenance. Here, again a utilitarian viewpoint

comes up and the whole of ethical discourse centres upon the application of science and technology for the benefit of mankind.

**Evidence 3(c):** “There is growing public anger that certain companies are being granted patents for products and technologies that make use of the genetic materials, plants and other biological resources that have long been identified, developed and used by farmers and indigenous people of a specific region/country.” (code 3.1.4) (*ibid.* p.214)

The statement discusses the issue of patenting of indigenous crops, methods of crop improvement as well as indigenous resources utilised by foreign multinational companies for their own profit and repute in the global market economy. This is clearly a breach of ethical values and virtues that a person or company should abide by, as well as of honesty and integrity. In terms of the pedagogical discourse (Bernstein, 1990), the text also highlights the unequal power relationships existing between the developed and developing nations and between the affluent and the poor. The ethical discourse here also involves the violation of human rights of farmers as their own ideas and local resources are patented and stolen and not only this but in spite of getting recognition they are being rebuked and even punished for using the patented resources (code 3.1.3).

**Evidence 3(d):** “The diversity of rice in India is one of the richest in the world. Basmati rice is distinct for its unique aroma and flavour and 27 documented varieties of Basmati are grown in India. There is reference to Basmati in ancient texts, folklore and poetry, as it has been grown for centuries. In 1997, an American company got patent rights on Basmati rice by US Patent and Trademark office. This allowed the company to sell a ‘new’ variety of Basmati, in the U.S and abroad. The ‘new’ variety of Basmati had actually been derived from Indian farmers’ varieties and claimed as an invention or a novelty.” (code 3.1.4) (*ibid.* p.214)

Here the ethical issue which could be raised is the virtue of trust, justice and honesty that has been appropriately addressed by the textbook. The ethical discourse that is evident here is the trade and utilisation of resources by the multinational companies and again a dominance of the influential and powerful groups over under-developed countries.

**Ethical Basis:** Thus, the present textual content provides food for thought in thinking about this issue of GM crops from an ethical perspective. However, the information given in the textbook is not sufficient as there are many more concerns that are being raised against GM crops which do not receive a mention

in the textbook. This includes the issue of food quality and nutrition, food safety, gene pollution and loss of biodiversity, development of antibiotic resistance and potential for gene transfer which could result in dilution of species diversity and production of super-weeds. The ethical discourse within the class 12 textbook is mainly centred on Bio patents and exploitation of indigenous resources by the foreign multinationals. The positive side of GM crops and GM organisms is being highlighted such as developing disease resistance, drought resistance, insect-resistance and increased yield of the crop. Thus, the

stance taken by the author is toward a utilitarian side although the text does mention the role of GEAC (Genetic Engineering Accreditation committee) in determining the impact of the new organism on the environment. Thus, some safety standards are maintained to check the proliferation of such genetically modified organisms in the environment.

### Discussion

The current textbook of class 12 Biology only fleetingly discusses the ethical issues attached to some of the contemporary and widely applicable technologies. Their treatment in the

### Ethical Issues Reflected in Biology Textbook

<i>Category No.</i>	<i>Category Name</i>	<i>Major Ethical Issues (with Codes)</i>
1.	Amniocentesis	1.1 Principle of equality 1.2 Sensitivity towards life and care for it (Right to Life) 1.3 Inherent biases in society (Patriarchy) 1.4 Medical profession ethics
2.	In-Vitro Fertilisation	a. Evading stigmatisation b. Wastage of embryos during IVF c. Use of IVF even by the fertile d. Principle of utilitarianism e. Increasing divide between haves and have-nots
3.	GM Crops	a. Unpredictability of the outcomes b. Maintenance of safety standards c. Threat to farmer's autonomy d. Gene patents and biopiracy e. Threat to biodiversity f. Emergence of Superweeds and Superbugs g. GM crops vs. Organic farming

textbook is usually restricted to their beneficial uses rather than discussing about some of the unforeseen and deleterious effects that such technologies can pose to the society. The three science and technology issues taken up in this paper viz., amniocentesis, in-vitro fertilisation and genetically modifying organisms come under controversial issues. As there cannot be any one particular view with respect to these issues so the text portraying just one side of these issues is not justifiable. There are many ethical debates that surround each of these issues, for instance, human rights debate and gender equality associated with amniocentesis, accessibility and resources for IVF and issue of wastage of human embryos that hold a human potential. Similarly, issues such as unpredictability of outcomes, gene pollution, emergence of super weeds, threat to biodiversity, etc are attached with GM organisms. Although one may say that these issues are highly subjective and have not been well-researched the point is not to be judgemental here but to give the real picture to our young readers. If not in the main text, then as vignettes, case studies or simply quoting researches from authentic sources, students should be given some idea about the complexity of these issues.

The teachers also feel that the present textbook only gives a brief

mention about the ethical issues as one of them said,

*“Ethical validity also needs to be discussed, but they are just touching upon the concepts, a very superficial treatment is being given. If we discuss these, it is fine, but if we leave them, then the child does not know that there could be so many ethical issues attached with this topic.”(Interview on Science Curriculum at Class 12, Case A1)*

According to her, such issues are important and should be addressed to the students:

*“Any technology which we are teaching to the students we should take into account not only its benefits but also its side-effects on nature, on environment, on soil, on humans. So, every time we do this we are sensitising the child toward the effects of advancement on nature. Such that later in life when the child grows up and uses whatever technology, then he knows that this harm could be caused by this technology and hence take responsible decisions in life as well as become a responsible citizen.”(Interview on Science Curriculum at Class 12, Case A1)*

Therefore, introducing students to these ethical issues in Science will help develop a responsible citizenry which is also one of the major aims of science education (NCF-2005). One of the respondents also highlighted the existence of ethical

issues within the present textbook of Biology by saying,

*“Yes, there are many ethical issues, they are talking about GM crops, conservation issues, ARTs, everywhere they have tried to integrate these issues into the curriculum.” (Interview on Science Curriculum at Class 12, Case B1)*

This can be taken as an overrated statement made by her, as having analysed the textbook from an ethical perspective we know that these issues do not receive their due share in the curriculum. One of the respondents feels the dearth of resource material and training required for dealing with the ethical issues in the classroom and opines,

*“Right now the issues are just touched upon and that too in some specific topics like GM crops and Biodiversity and Conservation. There should also be some resource material for the students as well as the teachers for building an understanding on these issues.” (Interview on Science Curriculum at Class 12, Case L1)*

Almost five out of ten teachers feel that these ethical issues should be discussed in the text alongside the topic and not as a separate section or chapter. This will help learners in connecting well with the issues and also aid comprehension. Putting it in a succinct way, one of the case respondents explained,

*“Ethical issues should be placed within the chapter; whenever I am teaching a concept I wish to discuss the issues then and there. I need not tell the students that these are ethical issues, but enable them in reasoning out and helping them reach a conclusion.” (Interview on Science Curriculum at Class 12, Case A1)*

This makes it evident that the teachers want to discuss these issues in a rather implicit manner by refraining from calling them ‘Ethical Issues’. This can be taken as a component of the hidden curriculum which tries to mask the critical importance attached to these issues. This also points toward the apprehension on the part of the teacher in treating these issues as ‘Ethical’. The reasons for this could be many, such as lack of proper orientation with respect to tackling these issues in classroom or inadequate knowledge and understanding about the discipline of ethics and mode of ethical enquiry; inability to handle multiple student views and responses on these issues which happen to be controversial and stimulate discussion and debate, etc.

Thus, an effort needs to be made from both sides, i.e., not just the curriculum of higher secondary science but also teachers’ involvement and deliberation on such issues of ethical relevance. The textbook should address these issues in greater depth citing relevant



discourses and evidences so as to engage the learners and the teachers both with the ethical issues. The mode of presentation of these issues needs to be made more explicit rather than implicit so as to make them more open and transparent.

### **Conclusion**

The evidences from the text give an indication that ethics and ethical issues are trying to occupy a space in the curriculum via its most useable pedagogic device (Bernstein, 1990) which is the textbook. An analysis of the text reveals that the ethical theories although not explicitly given or stated but remain implicit and need to be drawn out by the reader (in the present case, the teacher and the learner) so as to elaborate upon the inherent meanings of the text. However, at some points the text offers little scope for reflection and deliberation into the sphere of an ethical understanding vis-à-vis the three prominent Science and Technology issues taken up in the present study. Looking at the seriousness of these three issues an effort needs to be made in order to link the text with the major ethical discourses of our society and culture, for instance the issue of amniocentesis and its misuse can be linked to the patriarchal structure of society and the unequal status of women. Then, with IVF is attached the issue of

wastage of human embryos and the whole debate of ‘Where does life begin?’ Similarly, the issue of GM crops can be viewed from the angle of economic benefits of some foreign multinationals versus farmers’ distress and vicious cycle of debt. The textbook content needs to move beyond the mere subject matter boundaries so as to include the bigger issues plaguing the whole society. This will build up not only the awareness levels of the learners but also make them able decision-makers and problem-solvers which is also one of the broader aims of science education (NCF-2005). In this regard, the role of teachers cannot be neglected as they are the chief translators of the curriculum, therefore their engagement with these issues cannot be dismissed. The interviews with some high school Biology teachers revealed their inadequacy and unpreparedness to deal with the ethical issues in the classroom. This again suggests that serious gaps in the current NCERT Biology textbook vis-à-vis these issues. Hence a rethinking is required with regard to such issues in the curriculum, so that the vision is more holistic and multi-dimensional.

### **Educational Implications**

1. The textbook should provide some pointers for classroom discussion on ethical issues so

that they can be dealt within more detail.

2. The text should highlight some ethical theories on which a particular argument is based, as ethics has its own mode of enquiry that is different from sciences and thus the students need to be familiarised with it.
3. Certain case studies or vignettes can be included within the text or in the exercise section based on certain ethical dilemmas related to understanding of these ethical issues so as to assess students' understanding and decision-making skills.
4. The teachers should also be oriented towards dealing with such controversial issues in the classroom by way of intervention programmes and in their pre-service pedagogy paper.
5. Bigger discourses related to science and technology and their interface with society need to be

mentioned more prominently in the text, as at present it seems to be diffused.

### **Suggestions for Further Research**

1. Such research can be extended to a comparative textbook analysis of different countries wherein textbooks of Biology followed in different countries are analysed and compared. This can bring out some of the cultural components inherent in the text supporting a particular ethical norm/theory and discarding the others.
2. Besides textbooks, classroom discourses can also be analysed for understanding the process of transfer and transformation of knowledge by the teacher. This will help in building bridges between the knowledge 'given' and knowledge 'transmitted/translated'.

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**WEB-LINKS**

- <http://plato.stanford.edu/entries/ethics-environmental/>
- <http://scholarcommons.usf.edu/etd/1929>

# Secondary Teacher Education in Sikkim

## A Field Study

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SAROJ PANDEY\*\*

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### Abstract

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*Since the implementation of NCF 2005 the school education system has undergone a major shift in the content and pedagogical approach of teaching and learning. The NCF places demands and expectations on teachers which require them to de-learn their traditional approaches of teaching-learning and relearn new methods and approaches. In the process of education, however there is a chain of connecting agents: teacher educators, teachers and students. What and how students learn is affected by the knowledge structure of their teachers, who in turn are largely dependent upon our teacher education programmes for grounding and legitimising these knowledge structures. Teacher education institutions in this context play a key role in the process of quality improvement at the school stage. This symbiotic relationship between education and teacher education calls for change in teacher education curricula in tune with school education curricula to ensure effective implementation of policies.*

*The quality of teacher education, however is a matter of concern all over the country but more so in the north-eastern region which suffers from the problems of insurgency, violence, geographical remoteness, and lack of proper connectivity and communications with rest of the country and inadequate infrastructure facilities. The problem is further aggravated due to unqualified/under qualified teachers at various levels of education. The preliminary review of literature reveals lack of comprehensive data on the teacher education curriculum of the North-eastern region. There is lack of such information for Sikkim state also. Therefore, there was urgent need of a comprehensive study for quality*

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*improvement of teacher education system in Sikkim. The present paper is focussed on the curriculum backdrop and tries to explore the existing secondary pre-service teacher education in the north-eastern state of Sikkim along with the constraints experienced by the state in organising pre-service teacher education programme. It also tries to suggest suitable interventions for introducing desired changes in the curriculum and implementation of teacher education programme in Sikkim.*

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### **Need and Justification**

Since the implementation of NCF 2005, the content and pedagogical approach of teaching and learning has undergone a major shift in the school education system. The NCF 2005 places demands and expectations on teachers requiring them to de-learn their traditional teaching-learning approaches and to relearn new methods and approaches. However, the process of education involves a chain of connecting agents i.e. teacher educators, teachers and students. What and how students learn is affected by the knowledge structure of their teachers, which in turn is largely dependent on the teachers' education programmes. The teachers' preparation programmes have an effect of grounding and legitimising the knowledge structures in them. In this context, the teacher education institutions have a key role towards improving the quality of education at school stage. This symbiotic relationship between school education and teacher education curricula ensures effective implementation of policies and achieving desired results.

The quality of teacher education continues to be a matter of concern all over the country and more so in the north-eastern region which suffers from numerous problems like regional violence, geographical remoteness, lack of proper connectivity and communications with rest of the country and inadequate infrastructure facilities. The problem is further compounded due to unqualified / underqualified teachers serving at various levels of school education. A preliminary review of the teacher education institutions and teacher education curricula of the north-eastern region reveals that out of the total 73 secondary teacher education institutions in Arunchal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim, majority of institutions (64) are private institutions. Very scanty information is available about institutions in terms of any comprehensive study which can provide relevant information about the curriculum and the efforts made by these institutions to revise/ modify curricula in tune with the

emerging perspectives, nature of school experience programme, evaluation system being followed, quality of the reform efforts, and constraints experienced by the teacher education institutions in this region. The National Council for Teacher Education, NCTE conducted a survey of teacher education institutions in 1999 and the NCERT commissioned a multi-centric research study on teacher education programmes of several states in 2006 but these studies included only a few institutions in the state of Assam excluding all other states and Union Territories in the region. The lack of systematic and comprehensive information is a limitation in planning quality improvement of teacher education in the north-eastern region.

The present paper is focussed on the curriculum backdrop and tries to explore the existing pre-service teacher education for secondary school teachers in the north-eastern State of Sikkim along with the constraints experienced by the State in organising pre-service teacher education programme. Suitable interventions are suggested for introducing desired changes in the curriculum and implementation of teacher education programmes in the state of Sikkim.

### **Methodology**

The quantitative data was collected on questionnaires prepared using

survey method. All the secondary teacher education institutions of Sikkim were approached to provide information on various dimensions of teacher education such as the admission criteria, course structure and duration, transactional approaches, school experience programme, evaluation procedure, professional preparedness of faculty members, research and innovations undertaken by these institutions, infrastructural facilities, and financial and academic constraints etc. The quantitative data was corroborated and supported by qualitative data obtained through field visits to institutions in the state by the investigating team and holding focussed group discussions, and interviews with the faculty members and concerned functionaries. The data obtained through quantitative and qualitative methods was triangulated and given suitable statistical treatment to arrive at conclusions.

### **Teacher Education Curriculum in Sikkim**

The study combined both the quantitative and qualitative methods of data collection to get a more realistic picture of the teacher education curriculum being followed in Sikkim. Therefore, field visits were carried out in the state of Sikkim. The investigators interacted with different stakeholders like the

principal, teachers, student teachers and the university Department of Education wherever possible to have a holistic view of how the teacher education curriculum is developed and practised in the state, what are the impediments in practising the curriculum and how the quality of

The team visited all the three institutions Loyola College, Harkamaya College, Government B.Ed College, and Loyola College.

The Focus Group Discussion was done on the basis of certain guidelines developed for the purpose,

Table 1

**Demographic profile of teacher education institutions of Sikkim**

<i>Name of College</i>	<i>Year of establishment</i>	<i>Year of starting B.Ed programme</i>	<i>Total student intake</i>	<i>Number of Faculty members</i>
Harkamaya College of Education, Samdur Tadgong	2003	2003-04	100	12
Loyola College of Teacher Education	1993	1994-95	100	10
Soreng College of Teacher Education	2009	2010	100	07

input can be improved to assure the quality of output.

Sikkim is located in the lap of mountains and is one of the most beautiful places of India. The literacy rate of Sikkim has seen a phenomenal rise from 68.81 percent according to 2001 census to more than 82 per cent in 2011 Census (Census of State: Sikkim). Sikkim has three teacher education institutions offering B.Ed degree. These are:

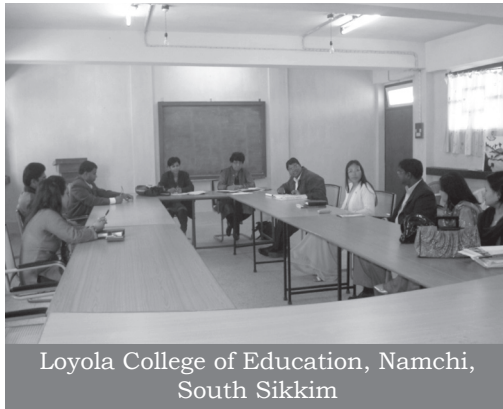
- Loyola College of Education, Namchi, South Sikkim
- Harkamaya College of Education, Samdur Tadgong, East Sikkim
- Sikkim Government B.Ed. College, Soreng, West Sikkim

and included the curriculum being followed in the institution, its year of revision, the procedure followed in the revision of teacher education curriculum, the involvement of teacher education institutions being visited in curriculum revision process, teaching-learning process being followed in the teacher training institution, provision and practice of school experience programme, evaluation procedure, research and innovation undertaken by the teacher educators, linkages of teacher education institution with other state level institutions and university, and provision for



professional development of teacher educators of the institution. The opinion of student teachers about the B.Ed. course, its transaction, and appropriateness for contemporary needs of schools had been taken through interaction with students. The results of Focus Group Discussion with principals and teacher educators of the state are presented below:

rural background and facing language problems as the medium of instruction is English at B.Ed. level. In this college 20 per cent candidates are in-service teachers nominated by Sikkim government; 80 per cent are selected through admission test. Most of the student teachers in these colleges are from Social Science background and the state in general also faces shortage of science teachers. The Loyola



Loyola College of Education, Namchi,  
South Sikkim



Harkamaya College of Education,  
East Sikkim

Focus Group Discussion with Faculty Members of Teacher Education Institutions in Sikkim

### Admission Policy

Though the admission at B.Ed. level in any institution is a policy issue determined by the university, yet little variation has been reported by the institutions in the admission policy they follow. While the Soreng College is the youngest amongst all the three institutions, and is a government institution located in rural area having students with

College is the oldest one having minority status. It has 30 per cent reservation for minority, 20 per cent for in-service teachers, 2 per cent for SC, 5 per cent for ST, and 1 per cent for students who require inclusive education. A total of 58 per cent seats are therefore reserved and 42 per cent are open to general candidates. The institution had the provision of Entrance Test upto 2009

but from 2010 switched over to merit based admission process. Harkamaya College is a self-financing institution and has 30 per cent reservation for Sikkim students while 70 students come through open selection.

*One of the major problems experienced by all these institutions is difficulty in getting students with minimum eligibility criteria fixed by NCTE, which is minimum 50 per cent marks at the graduation level and institutions felt that further relaxation should be given on minimum eligibility criteria for students in this state.*

### **Curriculum Development**

The teacher education curriculum of the state was revised in the year 2009. Since there is no Department of Education in the Sikkim University, the university had framed a committee involving the principals of all the three institutions as well as experts from various parts of the country to revise the syllabus of B.Ed., However the teacher educators observed that the local context has not been significantly reflected in the syllabus though the Sikkim University has introduced Eastern Himalayan Studies as compulsory subject for students at graduate level. The faculty members suggested that contents like history of education in Sikkim; problems of adolescents

in North-Eastern Region should be included instead of general growth and development of adolescent. NCF 2005 was referred to while modifying the curriculum. *The faculty members as well as the principals also expressed the need to remove the rigidity in terms of uniformity of implementation of the teacher education curriculum in the state keeping in view the diversity of student population in the state (based on the discussion with faculty).* The curriculum of the state does not seem to refer to any specific Teacher Education Curriculum Framework suggested by NCTE. None of the NCTE Frameworks recommended 'Principles of Education and Curriculum Development' or instructional Science and Evaluation as the foundation paper.

### **Curriculum Transaction**

Though there is emphasis on adopting more participatory and learner centred method of teaching, involving students in discussion, collaborative learning, role play and working in project modes etc. but the teaching-learning approaches adopted in teacher education institutions in Sikkim remain predominantly lecture-based with students as passive recipients. Sometimes PowerPoint presentations were used by teacher educators in the class. Teacher educators of Soreng, which is located in a rural

area observed that students were very shy and passive due to their background and at times have communication problem as the medium of instruction is English. Students are required to submit assignments and undertake case studies, reports of which are presented and evaluated. These presentations are followed by interaction and discussion. The B.Ed. institutions in Sikkim have provision of community work. Each student has to submit the report of community work which is evaluated and 25 marks are allocated for this work.

### **School Experience Programme**

All the three teacher education institutions follow a similar pattern of School Experience Programme. This includes pre internship phase of simulated practice teaching in the form of micro-teaching by students followed by 30 days of practice teaching in neighbouring schools. The duration of practice teaching is three weeks and organised in one stretch, not in a phased manner. Student teachers practise five teaching skills through 10 (5+5) micro teaching lessons each having a cycle of 20 minutes.

The procedure followed for micro teaching is—

- simulated demonstration
  - Micro-teaching by student teachers
  - video recording of micro teaching lessons
  - discussion based on students' performance and re-teaching
- On the basis of the interaction with faculty members of these three institutions, following conclusions have been drawn pertaining to the school experience programme being practised in the state:
- The simulated teaching on ten identified teaching skills is undertaken in the first semester, and the practice teaching in B.Ed. colleges of the state is done generally in the second semester after completing the theory papers. By that time the schools usually complete the course, consequently the student teachers are required to take revision courses, which creates discipline problems for student teachers.
  - The number of days assigned for practice teaching varies from institution to institution.
  - Herbertian method of lesson planning is still being followed in the state.
  - Supervision of lesson plans is done on the basis of Proforma developed by IGNOU under teacher education programme.
  - No orientation is given to principal and staff of co-operating school on their own roles and responsibilities at the time of practice teaching by student teachers.

- Only a few lessons are supervised by teacher educators during practice teaching.
- The reputation of the B.Ed. College seems to play a role in getting co-operating schools for practice teaching.
- The accessibility, proximity and location, and availability of transport facility, as well as number of student teachers in a particular location play a role in selecting 'practice teaching' school.
- Keeping in view the hilly terrain of Sikkim the distance of 'practice teaching' school from the college is the prime consideration for selecting school.
- Student teachers stay in the school even after their classes and participate in various activities of school, which is evaluated.
- The faculty members suggested the need for modification in the evaluation proforma developed by IGNOU, especially item No. 14 that deals with innovations in practice teaching. It was suggested that this item may be dropped or modified.
- Student teachers are expected to complete assignments, undertake community work of 15 days duration and submit case studies that are evaluated and 25 marks are allocated for it.

### **Infrastructural facilities**

The teacher education institutions in Sikkim in general lack proper infrastructural facilities and library facility. Computers are only used for routine office work and do not form part of teaching-learning process in any of these institutions.

### **Professional development of faculty members**

- The faculty members of all the teacher education institutions expressed concern over the lack of opportunities for their own professional development, which is a major demotivating factor for them. During interaction with teacher educators of the state, it was observed by the investigators that most of the teacher educators were unaware of the emerging trends such as thrust areas of NCF 2005, or Teacher Education Curriculum Framework 2009, reflective teaching and constructivism etc. It was expressed by teacher educators working especially in the private institutions that they are not included in the government initiatives for professional development of teacher educators and therefore do not have opportunities for their professional development, whereas they are equally responsible for quality improvement of education in the state.

- Majority of faculty members of these institutions are not engaged in any research or publication activities except for few individual efforts.
- The faculty members also in general lack knowledge about the teacher education curriculum frameworks, and those who were associated with curriculum development process did not refer any framework though the syllabi of other universities were referred to. In Soreng, which is a government institution, majority of teacher educators were found to be on deputation from schools having no exposure of teaching at any teacher education institution, therefore they experienced difficulty in teaching the B.Ed. students.
- The need for both orientation on emerging issues and concerns of education and teacher education and refresher courses to update knowledge and pedagogical content areas was felt by the teacher educators and institutions of the state.
- There is no provision in these institutions to financially sponsor any teacher educator to attend any seminar or conferences, though they are given duty leave to attend such programmes.
- The teacher educators and principals of all the three institutions strongly expressed

the desire to attend the professional development programmes organised by national organisations such as NCERT or NUEPA etc. The areas in which they need training are micro teaching, action research, innovative practices, and computer application.

### **Institutional Linkages**

There is also lack of linkage between various institutions of the state; even the government teacher education college of Soreng expressed its dissatisfaction with the institutional linkage with SCERT that is only a stone's throw away from the institution. The faculty members have developed linkages with various institutions on personal basis, but all the institutions felt that better linkages should be ensured between SCERT, SIE, SSA and DIETs etc in the state.

### **What student teachers feel about teacher education curriculum and programme?**

As indicated earlier, wherever student teachers were available, their responses were sought on various aspects of the teacher education programme they have opted for, the existing teacher education curriculum, curriculum transaction approaches, school experience programme, duration of B.Ed programme, and evaluation

procedure being followed. The responses received from student teachers of all the three institutions were analysed and the conclusions were derived, as presented below.

Student teachers were more vocal in their views regarding the curricular content and curriculum transaction that speaks of the state of affairs from consumers' point of view. Interaction with students revealed the following :

- The teacher education curriculum being followed in the state appears to be too lengthy and student teachers felt that one year was not sufficient to cover the syllabus. Majority of students, therefore, observed that either the syllabus should be pruned down removing outdated and unrelated content or the duration of the course should be increased.
- Students felt that the paper entitled 'Psychology of Development and Learning (paper II)' is very lengthy and very difficult to complete in one semester.
- Students also opined that paper I dealing with philosophical and sociological perspectives needs overhauling to make it more practice oriented and interesting.
- The transactional approaches adopted by some of the teachers were considered by students as 'very boring' and only lecture based, making it difficult to

understand, and that increased the difficulty level of the course content.

### **Focus Group Discussion with Student Teachers**

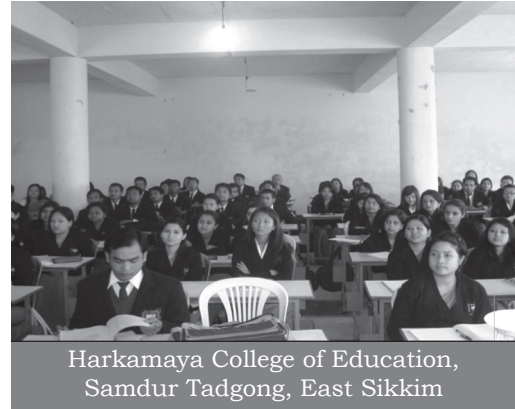
- Student teachers of all the colleges observed that they are left with very little choice in selection of subjects for practice teaching, especially students coming from commerce background, and felt that more flexibility needs to be adopted in this regard.
- One of the crucial observations made by students of all these institutions was lack of systematic effort in practice teaching which the students felt is the weakest link of their teacher education programme. Student teachers, during focus group discussion reported that there was no uniformity in the format of lesson plan that leaves them confused.

One student said –

Before going to practice teaching only demonstration lesson was given, faculty members did not show us the actual format and we were sent to school for practice teaching. Different faculty comes to supervise our classes, and gives us his/her own format. It creates confusion for us... We have only a rough idea of how to develop lesson plans.'



Sikkim Govt. B.Ed. College, Soreng,  
West Sikkim



Harkamaya College of Education,  
Samdur Tadgong, East Sikkim

- This statement reflects the state of affairs of school experience programme in the state. Students felt that more practical work should be included in the syllabus and theory part should be reduced.
- Student teachers were also very vocal about the infrastructure facilities available in these institutions, specially the self-financing one, which lack proper infrastructure and hostel facility for boys and girls enrolled for the B.Ed. course. Student teachers of one of the B.Ed. Colleges observed that they are forced to stay in hostel as it is mandatory for all students including the local students and exemptions are made only in exceptional cases. They also felt that library should be updated as there are insufficient books in the libraries of these institutions. The student teachers and teacher educators were united on non-availability of the reference books mentioned in the syllabus and observed that it should be modified and be realistic in terms of including available books only.
- Student teachers felt that ICT facilities and its use in classroom transaction should also be improved and labs should be made available to students for practical work.
- The neglect of co-curricular activities in B.Ed. programme was also one of the major concerns highlighted by the student teachers. They felt the need for more thoughtful integration of co-curricular activities in overall B.Ed. programme, essential provision of playground in teacher education institutions with adequate equipment for various sports. It is pertinent to mention here that the norms of NCTE for

giving recognition to any institution to start B.Ed. programme specifies a list of games and sports material and availability of adequate playground, but these institutions did not have sufficient facilities as observed by the investigators during the visit, except the teacher education institution at Namchi which has a big campus.

### **Suggestions for Improvement in Teacher Education**

The study suggests the need for overhauling of teacher education curriculum at the secondary level to address the changes in the current school education system of the country and prepare future teachers to reflect these changes in their classroom practice. Teacher education curriculum of the state of Sikkim needs to be modified in the light of National Curriculum Framework for Teacher Education (2009) developed by NCTE in the background of NCF 2005 and Right to Education Act 2009. This Framework articulates the vision of teacher education as: helping teachers to become reflective practitioners, providing opportunity to student teachers for self-learning, reflection, assimilation and articulation of new ideas, and facilitating student teachers to observe and engage with children and develop ability of critical thinking etc.

The existing cut-off marks for admission to B.Ed. programme are 50 per cent and the institutions feel that sometimes it is difficult to get candidates with this percentage; therefore, there should be relaxation in cut-off marks.

The effort made by the state to modify its curriculum does not address any such change visualised by NCFTE 2009. Therefore, as suggested by teacher educators, a comprehensive effort should be made to bring systemic reform through modification of teacher education curriculum of the state. The curriculum of teacher education should focus on developing life skills, values and peace education, guidance and counselling etc. The applied nature of content taught in various papers should be emphasised.

Teacher educators and students, both felt that the teacher education curriculum of Sikkim is unrelated to the local context and should be modified. The local issues and concerns of Sikkim, especially adolescent problems, should be given more weightage in the B.Ed. curriculum of the state. Context specific issues and concerns of various states of the region need to be highlighted and integrated in more effective manner to help teachers become change agents in the real sense. The present fragmented approach that provides



half-baked information about local issues is not sufficient. The state of Sikkim is suffering from many problems and socio-cultural issues which should find adequate place in the teacher education curriculum.

School experience programme (SEP) is an important component of teacher preparation but has been found to be the most neglected area of the teacher education curriculum. Student teachers of the states where the team visited expressed their concern and dissatisfaction about the way practice teaching is treated in their respective colleges. They were quite vocal regarding the lack of clarity about the format of lesson plan, and method of transaction. It is felt that teacher educators of the region need a professional development programme specifically focussed on SEP. It may tremendously help these institutions if the national level institutions like NCERT, NCTE or any university Department of Education evolves a training programme on SEP for training of teacher educators of the region.

A number of national level initiatives are directed towards quality improvement of education. However, it is pertinent to note that majority of teacher education institutions of the state are private and self-financing which do not come under the preview of any government initiative. This has created a very peculiar situation in

the state. While ensuring the quality of education is the responsibility of all – private or government professional development needs of teacher educators of government institutions are well taken care of, but the teacher educators of private institutions are left on their own.

The faculty members of various private institutions expressed their concerns about lack of opportunities for them to update and upgrade their knowledge and felt that national level institutions like NCERT and NUEPA etc. should organise professional development programmes for both government and private teacher educators keeping in view that they are equal parties in ensuring availability of good teachers in schools of the region.

The teacher education institutions are suffering from non-availability of teacher education candidates from science stream which requires immediate attention to prevent shortage of science teachers in the state in future. This concern also finds a place in the Vision 2020 report but needs to be translated into action.

While teacher educators suggested that the existing one-year duration of teacher education programme is sufficient and should continue, students felt it should be increased to two years. ICT should be an integral component of

transactional approach and teacher educators should be given orientation on ICT integration. There is a strong need to develop close institutional linkages between various institutes

and university Departments of Education of various states to bring quality improvement of education in the region.

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## **BOOK REVIEW**

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### ***Motivating Every Learner***

**AUTHOR :** Alan Mclean

**YEAR :** 2009

**PUBLISHER :** Sage Publications, London

Alan McLean, who is a Principal Psychologist in one of Scotland's educational services, has written this book for teachers on how to motivate learners effectively by accounting for individual differences. In his previous book *The Motivated School* (McLean, 2003) he offers a comprehensive and dynamic theory of motivation for learning, and in this book he talks about how to bring motivation in the classroom. The book draws on the experiences that Alan McLean has had in life with his children and also his work in schools, one of which was a special school for students having emotional and behavioural problems. Apart from these books he has developed several training programs which are being used widely both by teachers and education administrators in Scotland.

In this book McLean looks into motivation as a two-way process and its impact on learners' aspects of learning and discipline. The book is

a useful one for anyone who wants to understand the dynamics of motivation for learning, but it primarily focusses on teacher-pupil interaction, as his earlier works. It is divided into five parts focussing on the pupil, their strategies for self-motivation, what teachers do to motivate their pupils, how pupils adapt to the classroom climate through their learning stances and finally how teachers need to adapt to pupils' different stances.

The first two chapters focus on 'teacher-pupil interactions and how they can promote pupil's engagement in learning and motivational resilience' (p.5). Motivation is seen by the author as a complex interaction between the individual, his/her relationship (in this case the teacher and peer) and between the school and the outside world. McLean presents all these aspects, in the form of a matrix where different permutations and combinations can be worked out in the aspects of

motivation. Further in the chapter McLean goes on to list the three needs of the learner namely 'Affiliation, Agency and Autonomy', which he refers to as the "three As". This 'Learner Need Matrix' forms the basis of discussions in the later chapters. These needs are seen as giving power and direction to the goals of an individual. And the satisfaction of these needs will influence self-motivation of the pupils. The 3A needs of McLean are influenced by one of psychology's new and influential theories called 'Self-Determination Theory', as propounded by Deci and Ryan. These relationships and interactions are defined convincingly with examples, for better understanding of the reader.

After listing the basic goal and concepts behind learner motivation in the first part, the second part of the book talks about what learners do to motivate themselves. Here the author traces the link between needs shaping personality and the relationships as catalyst to their motivation. The personalities are seen as an interactive process of resilience and reactivity, leading to three types of personality — resilient, cautious and impulsive. If the 3As are met, then the pupil will experience energising emotions and if unmet, children's emotions would be negative — restricting, draining and distorting.

The third section talks about what teachers do to motivate their pupils through their different teaching styles. Here the teacher is viewed as an individual whose teaching style and strategy to motivate the pupils is influenced by his/her own motivation. McLean has been able to account for nearly all possible links to learner's motivation by giving due attention to the aspect of work conditions of the teachers as a prerequisite for engaging pupils in learning. The chapters effectively show how the teacher's motivation is an essential prerequisite to pupil motivation. It also discusses how the interaction of the four energisers with the 3A needs can be formed as the basis of analysing the classroom climate. Besides, McLean also touches upon the content of curricula and its impact on pupil motivation, though the issue would have been dealt with in greater detail as both school and teacher perform within the boundaries set by the curricula.

The fourth part of the book goes on to discuss how the matrix works in developing different learning stances and the learners' adaptation. The concept of 'learning stances' is elaborated in this section which acts as a classroom-focussed guide for teachers. He comes up with nine learning stances, associated with the 3A design. The stance matrix in this part helps teachers to better understand the pupils and thereby

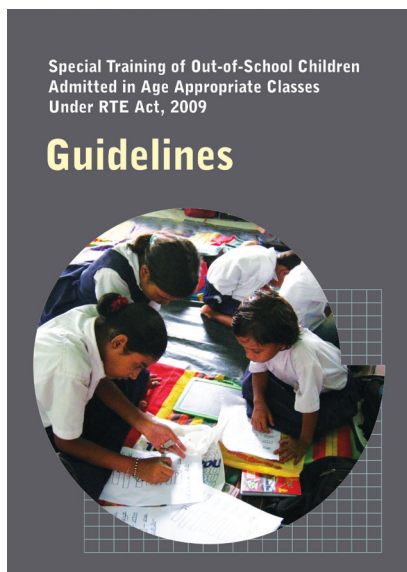
utilise the correct teaching style for developing effective motivating attitude to learn. The book concludes with a description of stance-specific teaching styles and energisers for teachers which will help them motivate every pupil in their classroom and school to learn.

After reading the book one who thinks: Are the teacher, pupil and peers the only important links in the motivation of the learner at school? I for one would love to see how the administration, curricula along with other school practices could be managed to impact learner motivation. Though the book does touch upon the aspect of the curriculum yet it does not deal effectively with this issue and leaves the reader wanting more. No doubt the book has been written in a style that simply puts across complex concepts in practicable ways. Important concepts have been duly

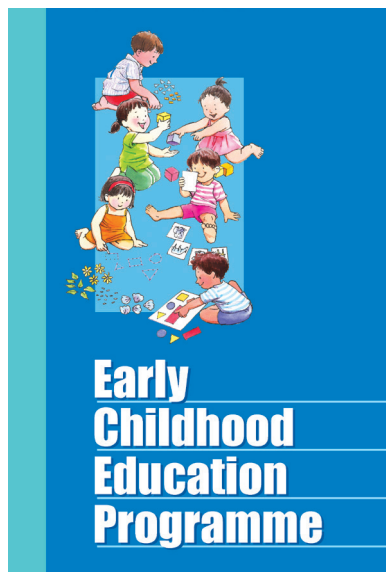
represented in a clear and concise manner for easy reference. The book is focussed on driving across the understanding of motivation in learners and though draws from the research both early and recent that has contributed to the development of the concept of motivation but does not burden the school teacher who is the target reader of the book with their references and details. On the whole, the book is a simple and effective guide for teachers, for both beginners and experienced alike, to bring about effective teaching and instil learning motivation in students, taking special consideration of varying pupils' learning abilities. This dynamic of teacher-pupil interaction, being a two-way process, is not easy to operationalise the way the book proposes, however if followed strictly then it will stimulate effective teaching-learning experience, which was long missing and forgotten.

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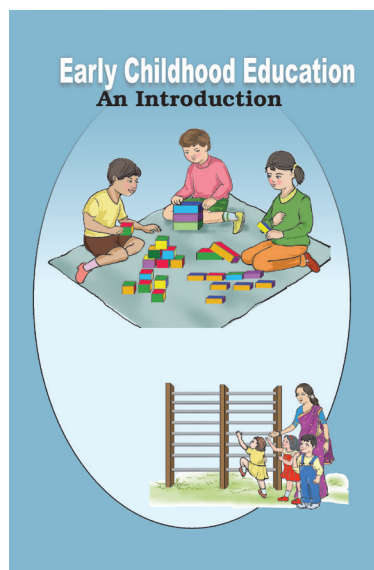
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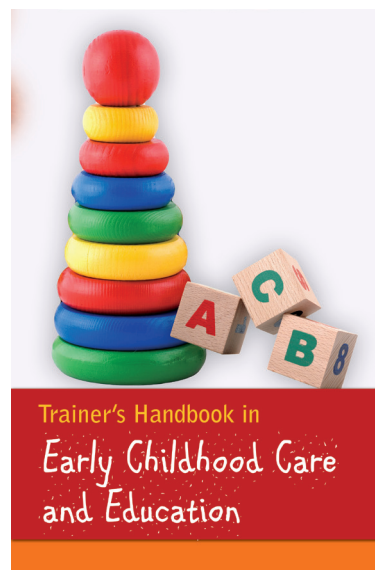
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Initial short-listing of applications will be carried out on the basis of relevance and quality of the brief write-up (in the prescribed format) in the proposed area of research to be submitted along with the application form. Short-listed candidates will be required to appear for a written test and those qualifying in written test will be subjected to personal interviews to assess their motivation and potential leading to final short-listing and preparation of panel of selected candidates, in order of merit.

**Candidates must be possessing the eligibility qualification and submit marks statement at the time of written test on 20.06.2015.**

#### How to Apply

Candidates may apply in the prescribed form for admission to M.Phil. and Ph.D. programmes of the University along with three copies of the brief write-up (in the prescribed format) on the proposed research topic of a contemporary issue within the broad framework of educational policy, planning and administration. For further details, please refer to the M.Phil.-Ph.D. Prospectus, 2015-16 of the University.

The application form and the Prospectus can be obtained from NUEPA by remitting a sum of ₹ 200/- (₹ 100/- for SC/ST candidates) by demand draft in favour of Registrar, NUEPA, payable at New Delhi if required by Post or purchased in person. The Prospectus can also be downloaded from our website: www.nuepa.org by making online payment of ₹ 200/- (₹ 100/- for SC/ST candidates) and attach the receipt/confirmation slip with the application at the time of submission to NUEPA.

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– Registrar